

Alle de Brieven van /  
The Collected Letters of  
Antoni van Leeuwenhoek

# Alle de Brieven van Antoni van Leeuwenhoek

Uitgegeven, geïllustreerd en van aantekeningen  
voorzien door een Commissie van  
Nederlandse Geleerden.

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**Deel XX (Additional Letters to Previous Volumes)**  
Geredigeerd door DOUGLAS ANDERSON,  
LODEWIJK PALM, LIZZY ENTJES en HUIB ZUIDERVAART



Dutch – *History of Science* – Web Centre ([www.dwc.knaw.nl](http://www.dwc.knaw.nl))  
HUYGENS INSTITUTE (KNAW) – AMSTERDAM  
2024

# The Collected Letters of Antoni van Leeuwenhoek

Edited, illustrated and annotated  
by a Committee of  
Dutch scientists.

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Plaque of Delftware blue faience with the portrait of  
ANTONI VAN LEEUWENHOEK  
in celebration his membership of the Royal Society of London  
(18th century)

Rijksmuseum, Amsterdam, inv. no. BK-NM-4444, (former collection of  
the Leiden Professor PETRUS VAN MUSSCHENBROEK, 1692 -1761)

See: VAN SETERS, "Leeuwenhoeck-Ceramiek" (1935), p. 1584,  
and HOUTZAGER & VAN DER MOLEN, "Eerbetoön" (1983).



Algemeen Voorwoord  
voor de Delen XVIII – XX  
&  
Voorwoord Deel XX

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General Preface to  
Volumes XVIII – XX  
&  
Preface Volume XX





## ALGEMEEN VOORWOORD BIJ DE DELEN 18-20

In 1920 schreef ABRAHAM SCHIERBEEK (1887-1974), een Haagse bioloog, een artikel over het leven en werk van ANTONI VAN LEEUWENHOEK, een tekst die hij afsloot met de volgende oproep:

Misschien [...] kunnen de biologen van Nederland zich verenigen om na 200 jaar de dood van VAN LEEUWENHOEK te vieren, door een fonds bijeen te brengen om een systematisch geordende nieuwe uitgave van zijn werken mogelijk te maken. Ons kleine land mag zijn grote zonen eer bewijzen!<sup>1</sup>

SCHIERBEEK herhaalde deze oproep meer dan een eeuw geleden, in september 1923, op een bijeenkomst in Apeldoorn van de Nederlandsche Natuurhistorische Vereeniging, tijdens de viering van de 200e sterfdag van VAN LEEUWENHOEK. In datzelfde jaar pleitte ook de Amsterdamse hoogleraar fysiologie GÉRARD ABRAHAM VAN RIJNBERK, destijds hoofdredacteur van het *Nederlandsch Tijdschrift voor Geneeskunde*, voor publicatie van de brieven van VAN LEEUWENHOEK. Hij was daartoe aangemoedigd door de Engelse onderzoeker CLIFFORD DOBELL, die in Londen, in het archief van de Royal Society, een groot aantal ongepubliceerde brieven van VAN LEEUWENHOEK had gevonden.

Na 1923 duurde het door allerlei omstandigheden tot 31 januari 1931 voordat er een officiële Commissie werd ingesteld door de Koninklijke Nederlandse Akademie van Wetenschappen (KNAW), die tot taak had de “verzamelde geschriften” van VAN LEEUWENHOEK uit te geven. Het eerste deel van *Alle de Brieven van Antoni van Leeuwenhoek* werd vervolgens in 1939 gepubliceerd, geredigeerd, geïllustreerd en van aantekeningen voorzien door “een Commissie van Nederlandse geleerden”.

Nu, in 2024, met de gelijktijdige publicatie van de delen 18, 19 en 20, is dit project eindelijk voltooid. Al met al heeft het project *Alle de Brieven* langer geduurd dan het hele leven van VAN LEEUWENHOEK zelf. Het duurde zelfs twee keer zo lang als VAN LEEUWENHOEK'S productieve periode als microscopist.

Hoe is dit mogelijk? Dat is een legitieme vraag. In 1990 concludeerde de Nederlandse wetenschapshistorica MARIAN FOURNIER na het verschijnen van deel 12 dat de Leeuwenhoekcommissie zich in 1931 een veel te moeilijke taak had gesteld. In feite had de Commissie ervoor gekozen om meerdere taken tegelijk uit te voeren: naast een complete, zorgvuldig geredigeerde editie van de tekst van alle brieven van VAN LEEUWENHOEK wilde men ook een uitputtende interpretatie van zijn werk, waarvoor een groot aantal gespecialiseerde medewerkers nodig was, die allemaal hun zegje moesten doen. Het werk van LEEUWENHOEK moest zowel in de context van de kennis van zijn tijd als in de context van de hedendaagse wetenschappelijke kennis worden geplaatst. Met andere woorden: het project vereiste een breed scala aan taalkundige, wetenschappelijke en historische annotaties, die in de praktijk bijna onmogelijk te organiseren bleken.

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<sup>1</sup> Tekst geparafraseerd naar 21<sup>e</sup>-eeuws Nederlands. Voor de verwijzingen zie het Engelstalige voorwoord.

Toch is het werk nu voltooid, en biedt het zelfs meer dan de Leeuwenhoekcommissie in 1931 voor ogen stond. Naast de bekende brieven van VAN LEEUWENHOEK, zijn in deze serie nu ook alle bekende brieven aan VAN LEEUWENHOEK te vinden. En terwijl de eerste redacteurs voornamelijk biologen en artsen waren, hebben in de loop van tijd wetenschapshistorici deze taak overgenomen.

Formeel werd de Leeuwenhoekcommissie in 1931 opgericht als werkgroep van de KNAW tijdens de voorbereidingen op het derde eeuwfeest van VAN LEEUWENHOEKs geboorte. In 1994 werd het project overgedragen aan een geesteswetenschappelijk instituut van de KNAW, het huidige Huygens Instituut. Dat instituut presenteert nu tegelijkertijd de laatste drie delen van dit project. Geheel volgens de tijdgeest zijn deze delen nu direct online – in open access – beschikbaar. Wie de tekst op papier wil hebben, heeft de mogelijkheid om deze delen in een *print-on-demand* versie aan te schaffen.

Omdat nu pas een compleet overzicht van de volledige correspondentie van VAN LEEUWENHOEKs kon worden gevormd, is besloten de nummering van alle brieven aan te passen. Het is begrijpelijk dat er in de loop van het project inconsistenties zijn geslopen door verschillende wijzigingen in het redactionele beleid. Aanvankelijk was het beleid om alleen brieven van VAN LEEUWENHOEK op te nemen, waarbij elke brief een uniek nummer kreeg. Vanaf deel 8 begon de redactie echter ook brieven aan VAN LEEUWENHOEK toe te voegen. Deze brieven werden niet genummerd en werden gepubliceerd op de datum die in de brief zelf stond. Voor ongeveer de helft van deze brieven was dit de datum van de “Oude” Juliaanse Stijl, die tot 1752 in Engeland werd gebruikt, en voor de rest werd de datum van de “Nieuwe” Gregoriaanse Stijl gebruikt, die in delen van de Nederlandse Republiek en elders in West-Europa werd gebruikt. Vanaf deel 17 werden de brieven aan VAN LEEUWENHOEK niet alleen opgenomen, maar ook genummerd, waarmee het oude patroon werd doorbroken. De lijst van correspondentie van VAN LEEUWENHOEK bevat echter ook een aantal brieven die nog niet eerder bekend zijn geweest, en ook brieven die alleen bekend zijn van een referentie. Bovendien zijn ook enkele relevante brieven over VAN LEEUWENHOEK opgenomen, met name brieven die na het overlijden van VAN LEEUWENHOEK zijn geschreven door familieleden, vrienden en collega's. Daarom is besloten een nieuwe chronologie samen te stellen van alle correspondentie van, aan en over VAN LEEUWENHOEK. Deze beslissing impliceerde ook een nieuwe nummering. De gekozen oplossing geeft het hele corpus een uniforme doorlopende reeks nummers, van L-000 tot L-601. Deze nummers vervangen de oude. Vanaf deel 18 werden de L-nummers toegepast en ook gebruikt in de voetnootverwijzingen naar de eerdere 17 delen.

Een andere verandering betreft de opmaak van de brieven. In eerdere delen werden de Nederlandse originele brief en de Engelse vertaling naast elkaar op tegenover elkaar liggende pagina's afgedrukt. In de laatste drie delen staat eerst de originele brief in zijn geheel, gevolgd door de Engelse vertaling. Ook worden de relevante afbeeldingen binnen de tekst geplaatst en indien nodig herhaald. Ten slotte is, om de eigennamen van mensen herkenbaarder te maken, de weergave van deze namen in klein-kapitaal (kleine hoofdletters) – zoals toegepast in de eerste delen van *Alle de Brieven* – hervat.

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Eindelijk is het ambitieuze plan om alle brieven van ANTONI VAN LEEUWENHOEK te publiceren tot een einde gekomen. In 1931 was het plan van de Leeuwenhoek Commissie voor de serie om alleen de brieven van LEEUWENHOEK te publiceren, samen met uitgebreide taalkundige en wetenschappelijke annotaties. In de Algemene Inleiding van deel 1 van *Alle de Brieven van Antoni Leeuwenhoek* schreef GERARD VAN RIJNBERK, voorzitter van de Leeuwenhoek Commissie van 1931 tot zijn dood in 1953:

De gehele uitgave zal worden afgesloten met een deel dat uitsluitend is gewijd aan LEEUWENHOECK en zijn wetenschappelijk werk. Het zal een volledig leven van LEEUWENHOECK bevatten, gebaseerd op de meest recente gegevens en biografische ontdekkingen. Bovendien zal een aantal Nederlandse wetenschappers in even zoveel objectieve samenvattingen de verdiensten van LEEUWENHOECK's onderzoeken schetsen.

De Commissie had niet voorzien dat de publicatie van de brieven van LEEUWENHOEK, waarvan vele voor het eerst in het Engels beschikbaar, zoveel wetenschappelijk onderzoek op gang zou brengen. In de decennia sinds de publicatie van deel 1 in 1939 zijn er verschillende biografieën van LEEUWENHOEK geschreven, zoals het belangrijke tweedelige werk *Antoni van Leeuwenhoek: Zijn Leven en Werken* door ABRAHAM SCHIERBEEK. Ook verschenen tientallen wetenschappelijke artikelen over LEEUWENHOEK'S werk. Daarnaast organiseert de website Lens on Leeuwenhoek het archief- en bronnenmateriaal over zijn leven om het voor wetenschapshistorici gemakkelijker te maken hun eigen boeken en artikelen te onderzoeken. Die website heeft een bibliografie van meer dan 850 primaire en secundaire bronnen. Nu het volledige corpus brieven eindelijk beschikbaar is, is er voor het eerst de mogelijkheid tot een volledige tekstuele analyse, waarbij alles ook online is in te zien.

In plaats van het oorspronkelijke voornemen van de Commissie om alleen de brieven van LEEUWENHOECK te publiceren, te beginnen met deel 8 en in elk deel doorlopend tot en met deel 14, hebben de samenstellers in totaal 13 onuitgegeven brieven van anderen aan LEEUWENHOEK opgenomen: drie van RICHARD WALLER en drie van HANS SLOANE, geschreven toen zij redacteur waren van *Philosophical Transactions*, drie van PIETER RABUS, redacteur van *De Boekzaal van Europa*, en elk één van opeenvolgend LEEUWENHOEK'S vriend CHRISTIAAN HUYGENS, de Schotse prediker en mystieke auteur GEORGE GARDEN, en de Lutherse predikant BENEDICT HAAN. Daarnaast zijn twee ongenummerde brieven van CHRISTIAAN HUYGENS' vader CONSTANTIJN opgenomen in brieven van LEEUWENHOEK aan de Royal Society en aan een Rotterdamse regent en stadsbestuurder HARMEN VAN ZOELÉN. Tot slot zijn 12 brieven van LEEUWENHOEK die alleen bekend zijn door verwijzing in andere brieven genummerd en opgenomen in deze eerdere delen.

Om het corpus compleet te maken, bevat dit deel 20 van *Alle de Brieven* 194 brieven van en aan LEEUWENHOEK van 57 verschillende correspondenten die ontbraken in deel 1 tot en met deel 17, toen het beleid veranderde, waarbij ook de brieven aan LEEUWENHOEK opgenomen zijn in deel 18 en deel 19. De meeste brieven in deel 20 zijn alleen bekend door

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verwijzing in andere brieven en bronnen. Ze omspannen bijna de hele loopbaan van LEEUWENHOEK, vanaf de brief van april 1673 van de Delftse arts REINIER DE GRAAF aan de secretaris van de Royal Society HENRY OLDENBURG tot de brief van augustus 1717 van ADRIAAN SWALMIUS, een naast familielid, aan LEEUWENHOEK. Deze 194 brieven omvatten 167 brieven aan LEEUWENHOEK en 26 brieven van LEEUWENHOEK, drie volledige brieven, één fragment en 22 brieven die alleen bekend zijn door verwijzing in andere brieven en bronnen.

LEEUWENHOEK richtte de 26 brieven, van Brief L-029 van 1676 tot Brief L-340 van april 1698, aan FRANCIS ASTON, ROBERT BOYLE, ISAAC NEWTON en JOSEPH WILLIAMSON in Londen en aan JOHAN ARNOLDI, VICTOR VAN BEUGHEM, GOVERT BIDLOO, JACOB CALCKBERNER, SIEWERT CENTEN, THEODORUS CRAANEN, PIETER HOTTON, CHRISTIAAN HUYGENS, GOTTFRIED LEIBNIZ, ANTONIO MAGLIABECHI, JAN MEERMAN, DANIEL VAN PAPENBROEK, MELCHISEDEC THÉVENOT, LAMBERT VAN VELTHUYSEN en HARMEN VAN ZOELÉN op het continent.

De drie volledige brieven waren onbekend ten tijde van de publicatie van de bundel waarin ze chronologisch hadden moeten worden opgenomen: Brief 45 L-083 van 11 mei 1679 aan de Utrechtse politicus LAMBERT VAN VELTHUYSEN, die in deel 3 als vermist stond vermeld, maar inmiddels is teruggevonden, Brief L-143 van 26 oktober 1683 aan de secretaris van de Royal Society FRANCIS ASTON, die in deel 4 ontbreekt, en Brief L-191 van 6 augustus 1687 aan de Engels-Ierse scheikundige ROBERT BOYLE, die in deel 7 ontbreekt.

Deel 20 bevat ook 14 brieven tussen anderen dan LEEUWENHOEK. Een daarvan is de brief uit 1683 van de Ierse student geneeskunde THOMAS MOLYNEUX aan ASTON waarin MOLYNEUX' bezoek aan het huis van LEEUWENHOEK wordt beschreven. De andere is een brief uit 1716 van de Delftse arts ABRAHAM VAN BLEYSWIJCK aan de Leidse professor HERMAN BOERHAAVE waarin verslag wordt gedaan van het konijn dat VAN BLEYSWIJCK en LEEUWENHOEK ontleedden bij LEEUWENHOEK thuis. De andere 12 zijn brieven die na de dood van LEEUWENHOEK zijn geschreven tussen functionarissen van de Royal Society in Londen en vrienden en familieleden van LEEUWENHOEK in Delft. De meeste van deze brieven gaan over de 26 microscopen, met bijgevoegde preparaten, die LEEUWENHOEK naliet aan de Royal Society en die zijn dochter na zijn dood aan hen stuurde.

Ten slotte bevat deel 20 twee relevante documenten die door anderen zijn geschreven: de notariële akte die de medaille documenteert die in 1716 aan LEEUWENHOEK werd aangeboden door de faculteit van de *studium generale* (universiteit) in Leuven en het artikel uit 1723 in de *Philosophical Transactions* van de vicepresident van de Royal Society, Martin Folkes, waarin de 26 gelegateerde microscopen worden beschreven en besproken.

Slechts enkele brieven in deel 20 bevatten wetenschappelijke observaties en discussies. Brief 45 L-083 van 11 mei 1679 aan VAN VELTHUYSEN bespreekt de figuren van planten die zichtbaar zijn in zaden, spiraalvormige vaten in zaden, in hout en in andere delen van planten, schimmel op oud leer en de vorming ervan, en leucorroë. Brief L-143 van 26 oktober 1683 aan ASTON bespreekt de cicricula in de dooier van eieren. Brief L-155 van 13 februari 1685 van MOLYNEUX aan ASTON bespreekt de microscopen van LEEUWENHOEK. In brief L-169 van 12 maart 1686 geeft THOMAS GALE uitleg over de reactie van de Society op een van LEEUWENHOEK'S brieven over katoenzaden, zweetporiën, alen en het mengsel van

vloeistoffen in bloed. In Brief L-502 van 3 maart 1714 bespreekt WALLER spieren bij insecten.

In brief L-338 van 21 maart 1698 stuurt de Leidse hoogleraar GOVERT BIDLOO LEEUWENHOEK een grondige studie van de wormen die in de lever van een schaap en de nabijgelegen delen zijn gevonden. Hij pleit tegen de praktijken van kwakzalvers en veel artsen die niet redeneren vanuit bewijs en de symptomen van ziekten verwarren met hun oorzaken. Gezien de lange lengte van BIDLOO'S brief is alleen een nieuwe Engelse vertaling opgenomen.

De 23 brieven in dit deel van de Italiaanse bibliothecaris ANTONIO MAGLIABECHI bevatten transcripties en vertalingen van de 14 brieven die zijn gepubliceerd in *De Boekzaal van Europa* en één in *Twee maandelijksse uittreksels*. Ze bevatten vooral publicatiegegevens en samenvattingen van boeken die onlangs in Italië in het Italiaans en Latijn zijn verschenen. Dit deel bevat alleen een lijst met auteurs, titels, uitgevers en publicatiedata. De eigenlijke teksten uit *De Boekzaal* zijn niet opgenomen omdat ze niet belangrijk zijn om het werk van LEEUWENHOEK te begrijpen.

Slechts drie van de brieven in dit deel zijn geïllustreerd met figuren, Brief 45 L-083 van 11 mei 1679 aan VAN VELTHUYSEN, Brief L-208 van 6 maart 1690 van CHRISTIAAN HUYGENS en Brief L-338 van 21 maart 1698 van BIDLOO. Daarnaast bevat Brief 35 [22] L-060 van november 1677 van LEEUWENHOEK aan de voorzitter van de Royal Society WILLIAM BOUNCKER een cijfer dat werd gemist toen het in deel 2 werd gepubliceerd.

De volgorde van brieven tussen Engeland en Holland tijdens LEEUWENHOEK'S leven kan verwarrend zijn vanwege het verschil in dateringssystemen. In 1582 namen de provincies Holland (waar LEEUWENHOEK woonde) en Zeeland de nieuwe Gregoriaanse kalender aan, bekend als Nieuwe Stijl (N.S.). Het compenseerde de onnauwkeurigheden van de oude Juliaanse kalender, bekend als Oude Stijl (O.S.), door tien dagen vooruit te slaan. In 1700 werd er nog een dag overgeslagen, zodat de data in Nederland elf dagen voorliepen op die in Engeland, dat de Juliaanse kalender behield tot 1753. Omdat brieven tussen Delft en Londen vaak drie of vier dagen nadat ze geschreven waren aankwamen, werden ze dan in Londen gelezen op een datum vóór de datum in Delft waarop ze geadresseerd waren.

Bovendien nam Holland in 1582 ook 1 januari aan als het begin van het jaar, terwijl Engeland het oude begin van 26 maart behield. Als gevolg hiervan worden data tussen beide landen soms uitgedrukt zoals bijvoorbeeld '16 februari 1682/3' aan het eind van ASTON'S brief L-123.

Om de werking van LEEUWENHOEK'S netwerk van correspondenten, waarvan velen in Engeland, te verduidelijken, zijn de data van alle brieven zelf in dit deel uitgedrukt in data nieuwe stijl.

Deel 20 zet het redactionele beleid voort dat ontstond toen de Leeuwenhoek-commissie, die voornamelijk uit vakwetenschappers bestond, geleidelijk werd vervangen door wetenschapshistorici. De voetnoten zijn vooral historisch, niet wetenschappelijk, verwijzingen naar hedendaagse wetenschappelijke bronnen en begrippen (die vaak pas na de negentiende eeuw ontstonden) zijn geminimaliseerd, de brieven zijn opeenvolgend geformatteerd in plaats van naast elkaar, de figuren zijn opgenomen in de tekst van de brieven en de nummering volgt het schema van de nieuwe L-nummers die met deel 18 zijn begonnen.

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Een nieuw beleid was nodig om dit deel beheersbaar te houden. De tekst van deel 20 is volledig in het Engels gesteld, met uitzondering van de originele Nederlandse teksten, zoals van LEEUWENHOEK zelf.

Deel 20 wordt afgesloten met 18 bijlagen of appendices. De eerste 13 bevatten een complete lijst van de brieven tussen LEEUWENHOEK en degenen die het meest met hem correspondeerden, in chronologische volgorde van hun eerste brief aan of van LEEUWENHOEK. Naast elk briefnummer en datum staat een korte opsomming van de inhoud van die brief. Dit betreft de volgende personen:

- 1 - CONSTANTIJN HUYGENS
- 2 - HENRY OLDENBURG
- 3 - ROBERT HOOKE
- 4 - FRANCIS ASTON
- 5 - ANTHONIE HEINSIUS
- 6 - ANTONIO MAGLIABECHI
- 7 - RICHARD WALLER
- 8 - PIETER RABUS
- 9 - FREDERIK ADRIAAN VAN REEDE
- 10 - HANS SLOANE
- 11 - GOTTFRIED WILHELM LEIBNIZ
- 12 - JOHN CHAMBERLAYNE
- 13 - JAMES JURIN

Nog eens drie appendices bevatten aanvullende informatie. Appendix 14 geeft een overzicht van alle mensen die deel uitmaakten van de Leeuwenhoek Commissie die toezicht hield op de publicatie van de eerste 14 delen van *Alle de Brieven/Collected Letters*, evenals de redacteuren, transcribenten en vertalers voor alle 20 delen. De namen van de tientallen experts die de wetenschappelijke voetnoten schreven staan er niet in; die zijn te vinden in de bijlagen bij de afzonderlijke delen.

Appendix 15 geeft een overzicht van alle eigentijdse uitgaven van de boekdelen met de 165 brieven die LEEUWENHOEK zelf koos om uit te geven. Ze werden gedrukt in Leiden en Delft in Nederlandse en Latijnse vertaling tussen 1684 en 1730.

Appendix 16 geeft een overzicht van alle bekende bezoekers van LEEUWENHOEK'S huis. De brieven en andere bronnen leveren in totaal 99 met name genoemde bezoekers op en tientallen ongenoemde bezoekers, van "gentleman amateurs" en "nieuwsgierigen" tot "eminente personen" en de "ambassadeur van een gekroond hoofd". Ze tonen de omvang van LEEUWENHOEK'S roem en de breedte en diepte van zijn netwerk.

Appendix 17 bevat de gebruikelijke lijst van alle gedrukte bronnen die in de voetnoten en opmerkingen bij de brieven in deel 20 worden geciteerd. Appendix 18 bevat een chronologische lijst van alle 602 brieven, 392 geschreven door LEEUWENHOEK en 193 aan hem geschreven door 83 verschillende correspondenten, waaronder zes die rechtstreeks naar Londen schreven en twee die relevante documenten schreven.

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Als concordantie vermeldt Appendix 18 voor elke brief het nieuwe L-nummer en, indien van toepassing, de 192 door LEEUWENHOEK genummerde brieven en het nummer en volume van elke brief in *Alle de Brieven*.

Appendix 19 worden tenslotte alle correspondenten vermeld die vermeld zijn in deze 20 delen met Leeuwenhoek brieven.

Voor hun bijdragen aan de vertaling van de Latijnse brieven in deze bundel wil de redactie LEO NELLISSEN (L-066), MAURITS VAN WOERCOM (L-101; L589) en HENK NELLEN (L-338) bedanken. In de lange traditie van hulp van de Royal Society bij dit project, heeft KEITH MOORE, hoofd van de 'Library and Information Services' van de Royal Society, geduldig en grondig gereageerd op onze redactionele zorgen en veel van de originele documenten beschikbaar gesteld.

Onze laatste dank gaat uit naar het Huygens Instituut, de langjarige sponsor van dit project, naar alle voormalige leden van de Leeuwenhoek Commissie, en naar onze voorgangers als redacteuren. We hopen dat we recht hebben gedaan aan het werk van de nieuwsgierige, ijverige microscopist uit Delft.

Amsterdam, november 2024.

DOUGLAS ANDERSON, LODEWIJK PALM, LIZZY ENTJES & HUIB ZUIDERVAART

Huygens Instituut

Koninklijke Nederlandse Akademie van Wetenschappen - KNAW

## GENERAL PREFACE TO THE VOLUMES 18-20

In 1920, ABRAHAM SCHIERBEEK (1887–1974), a biology teacher from The Hague, wrote an article about the life and work of ANTONI VAN LEEUWENHOEK, a text that he ended with the following appeal:

Perhaps [...] the biologists of the Netherlands may unite to celebrate [...] LEEUWENHOEK's death for 200 years, by raising a fund to enable a systematically arranged new edition of his works. [...] Our small country should honour its great sons!<sup>1</sup>

SCHIERBEEK repeated this call more than a century ago, in September 1923, at a meeting in Apeldoorn of the Nederlandsche Natuurhistorische Vereeniging (Dutch Natural History Association), during the celebrations of the 200<sup>th</sup> anniversary of LEEUWENHOEK's death.<sup>2</sup> That very year, the Amsterdam professor of physiology GÉRARD ABRAHAM VAN RIJNBERK, then editor-in-chief of the *Nederlandsch Tijdschrift voor Geneeskunde* (Dutch Journal of Medicine), also advocated the publication of LEEUWENHOEK's letters. He had been encouraged to do so by the English researcher CLIFFORD DOBELL, who had found a large number of unpublished LEEUWENHOEK letters in London, in the archives of the Royal Society.<sup>3</sup>

After 1923, due to various circumstances, it took until 31 January 1931 before an official Commission was set up by the Royal Netherlands Academy of Arts and Sciences (KNAW), whose task was to publish LEEUWENHOEK's "collected writings". The first volume of *The Collected Letters of Antoni Leeuwenhoek* was subsequently published in 1939, edited, illustrated and annotated by "a Commission of Dutch scholars".

Now, in 2024, with the simultaneous publication of volumes 18, 19 and 20, this project is finally completed. All in all, the *Collected Letters* project lasted longer than the entire life of LEEUWENHOEK himself. It even lasted twice as long as LEEUWENHOEK's productive period as a microscopist.

How is this possible? is then a legitimate question. In 1990, the Dutch science historian MARIAN FOURNIER concluded, after the publication of volume 12, that in 1931 the Leeuwenhoek Commission had set itself far too difficult a task.<sup>4</sup> In fact, the Commission had chosen to carry out several tasks at the same time: in addition to a complete, carefully edited edition of the text of all of LEEUWENHOEK's letters, an exhaustive interpretation of his work was also desired, requiring a large number of specialized staff, of whom all had to have their say. LEEUWENHOEK's work had to be placed both in the context of the knowledge of his time and in the context of contemporary scientific knowledge. In other words: the

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<sup>1</sup> A. Schierbeek, "Anthoni van Leeuwenhoek", *De levende natuur* (1920), 78. Reprinted in A. Schierbeek, *Van Aristoteles tot Pasteur* (Amsterdam, 1923), pp. 105-106. Text slightly paraphrased.

<sup>2</sup> *Natura* (15 september 1923); *Nederlandsch Tijdschrift voor Geneeskunde*, 67 (1923), p. 1059.

<sup>3</sup> G.A. VAN RIJNBERK, "Anthonie Leeuwenhoek, de ontdekker der konijnencoccidiën?", *Nederlandsch Tijdschrift voor Geneeskunde* 67 (April 1923), 1888.

<sup>4</sup> M. FOURNIER, "Zo Leeuwenhoek, zo Leeuwenhoek-commissie", *Tijdschrift voor de Geschiedenis der Geneeskunde, Wiskunde, Natuurwetenschappen en Techniek*, 13 (1990), pp. 265-271.



## GENERAL PREFACE

project required a wide range of linguistic, scientific, and historical annotations, which proved to be almost impossible to organize in practice.

Nevertheless, the work is now completed, and it offers even more than the Leeuwenhoek Commission set out to do in 1931. In addition to the known letters *by* LEEUWENHOEK, also all known letters *to* LEEUWENHOEK can now be found in this series of volumes. While the first editors were mainly biologists and physicians, as the decades progressed, historians of science have taken up the torch.

Formally, the Leeuwenhoek Commission was founded in 1931 as a working group of the Royal Netherlands Academy of Arts and Sciences (KNAW) during the preparations for the third centenary of LEEUWENHOEK's birth. In 1994 the project was transferred to a humanities institute of the KNAW, currently known as the Huygens Institute. That institute is now simultaneously presenting the last three volumes of this project. In accordance with the spirit of the times, these volumes are now directly available online – in open access. Those who desire to have the text on paper have an option to obtain these volumes in a print-on-demand version.

Because only now a complete overview of LEEUWENHOEK's correspondence could be formed, it was decided to adjust the numbering scheme of all the letters. Understandably, inconsistencies crept in over the long run of the project due to various editorial policy changes. Initially, the policy was to include only letters *by* LEEUWENHOEK, with each letter given a unique number. From volume 8, however, the editors also began to add letters *to* LEEUWENHOEK. These letters were not numbered and were published using the date stated in the letter itself. For about half of these letters this date was the “Old” Julian Style date, used in England until 1752, and the rest used the “New” Gregorian Style dates, used in parts of the Dutch Republic and elsewhere in Western Europe. From volume 17 onwards, the letters *to* LEEUWENHOEK were not only included but numbered, breaking the old pattern. However, the list of LEEUWENHOEK's correspondence also includes a number of letters that have not been known before, and also letters that are known only from a reference. Moreover, some relevant letters about LEEUWENHOEK are also included, especially those written by relatives, friends and colleagues after LEEUWENHOEK's death. It was therefore decided to compile a new chronology of all correspondence *by*, *to* and *about* LEEUWENHOEK. This decision also implied a new numbering. The solution chosen gives the entire corpus a uniform continuous series of numbers, from L-000 to L-601. These numbers replace the old ones. As of volume 18, the L-numbers were applied and also were used in the footnote references to the earlier 17 volumes<sup>5</sup>.

Another change concerns the layout of the letters. In previous volumes, the Dutch original letter and the English translation were printed side-by-side on facing pages. In the final three volumes, the original letter comes first in full, followed by the English translation. Also, the relevant images are placed within the text and repeated if required. Finally, to make the proper names of people more recognizable, the display of these names in small capitals – as applied in the first volumes of the *Collected Letters* – has been resumed.

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<sup>5</sup> DOUGLAS ANDERSON's “‘Your most humble servant’: the letters of Antony Leeuwenhoek”, *FEMs Microbiology Letters*, vol. 369, no. 1, 2022, was published before the decision was made to add a 20<sup>th</sup> volume and a uniform numbering system.

## PREFACE TO VOLUME 20

At long last, the ambitious plan to publish the all of the letters written by ANTONI VAN LEEUWENHOEK has come to its conclusion. In 1931, the Leeuwenhoek Commission's plan for the series was to publish only the letters from LEEUWENHOEK, along with copious linguistic and scientific annotations. In the General Introduction to volume 1 of *The Collected Letters of Antoni Leeuwenhoek*, GERARD VAN RIJNBERK, chair of the Leeuwenhoek Commission from 1931 until his death in 1953, wrote,

The whole edition will be concluded by a volume dedicated exclusively to LEEUWENHOECK and his scientific work. It is to contain a complete life of LEEUWENHOECK, based on the most recent data and biographical discoveries. Moreover, a number of Dutch scientists will sketch the merit of LEEUWENHOECK's investigations in as many objective summaries.

The Commission did not anticipate the scholarship about LEEUWENHOEK that publication of the letters, many of them available for the first time in English, would initiate. In the decades since the publication of volume 1 in 1939, several biographies of LEEUWENHOEK have been written, most notably ABRAHAM SCHIERBEEK's two-volume *Antoni van Leeuwenhoek: Zijn Leven en Werken*, along with books and dozens of articles about LEEUWENHOEK's scientific work. In addition, the website Lens on Leeuwenhoek is organizing the archival and source material about his life to make it easier for historians of science to research their own books and articles. That website has a bibliography of over 850 primary and secondary sources. Now that the complete corpus of letters is finally available, the opportunity for textual analysis, especially computer-aided, is possible for the first time.

Instead of the Commission's originally intention to publish only the letters written by LEEUWENHOECK, beginning with volume 8 and continuing in every volume through volume 14, the editors included a total of 13 unnumbered letters from other people to LEEUWENHOEK: three from RICHARD WALLER and three from HANS SLOANE written while they were editors of *Philosophical Transactions*, three from PIETER RABUS, editor of *De Boekzaal van Europe* (Library of Europe), and one each from LEEUWENHOEK's friend CHRISTIAAN HUYGENS, Scottish preacher and mystic author GEORGE GARDEN, and Lutheran pastor BENEDICT HAAN. In addition, two unnumbered letters from CHRISTIAAN HUYGENS's father CONSTANTIJN were contained within letters written by LEEUWENHOEK to the Royal Society and to a regent and city official from Rotterdam HARMEN VAN ZOELÉN. Finally, 12 letters from LEEUWENHOEK known only by reference in other letters were numbered and included in these earlier volumes.

## PREFACE TO VOLUME 20

To complete the corpus, this volume 20 of *Collected Letters* contains 194 letters to and from LEEUWENHOEK from 57 different correspondents that were missed in volume 1 to volume 17, when the policy changed to include letters to LEEUWENHOEK in volume 18 and volume 19<sup>1</sup>. Most of the letters in volume 20 are known only by reference in other letters and sources. They span almost the whole course of LEEUWENHOEK's career, from the April 1673 letter from Delft physician REINIER DE GRAAF to Royal Society secretary HENRY OLDENBURG to the August 1717 letter from ADRIAAN SWALMIUS, a close relative, to LEEUWENHOEK. These 194 letters include 167 letters to LEEUWENHOEK and 26 letters from LEEUWENHOEK, three full letters, one fragment, and 22 letters known only by reference in other letters and sources.

LEEUWENHOEK addressed the 26 letters, from Letter L-029 of 1676 to Letter L-340 of April 1698, to FRANCIS ASTON, ROBERT BOYLE, ISAAC NEWTON, and JOSEPH WILLIAMSON in London and to JOHAN ARNOLDI, VICTOR VAN BEUGHEM, GOVERT BIDLOO, JACOB CALCKBERNER, SIEWERT CENTEN, THEODORUS CRAANEN, PIETER HOTTON, CHRISTIAAN HUYGENS, GOTTFRIED LEIBNIZ, ANTONIO MAGLIABECHI, JAN MEERMAN, DANIEL VAN PAPENBROEK, MELCHISEDEC THEVENOT, LAMBERT VAN VELTHUYSEN, and HARMEN VAN ZOELEN on the continent.

The three full letters were unknown at the time of the publication of the volume in which they should have been inserted chronologically: Letter 45 L-083 of 11 May 1679 to Utrecht politician LAMBERT VAN VELTHUYSEN, which was listed as missing in volume 3 but has since been recovered, Letter L-143 of 26 October 1683 to Royal Society secretary FRANCIS ASTON, missing from volume 4, and Letter L-191 of 6 August 1687 to Anglo-Irish chemist ROBERT BOYLE, missing from volume 7.

Volume 20 also has 14 letters between people other than LEEUWENHOEK. One is the 1683 letter from Irish medical student THOMAS MOLYNEUX to ASTON describing MOLYNEUX's visit to LEEUWENHOEK's house. The other is a 1716 letter from Delft physician ABRAHAM VAN BLEYSWIJCK to Leiden professor HERMAN BOERHAAVE that reports on the rabbit that VAN BLEYSWIJCK and LEEUWENHOEK dissected at LEEUWENHOEK's house. The other 12 are letters written after LEEUWENHOEK's death between Royal Society officials in London and LEEUWENHOEK's friends and relatives in Delft. Most of these letters discuss the 26 microscopes, specimens attached, that

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<sup>1</sup> VAN RIJNBEEK's 1934 call for missing letters, "Leeuwenhoeck-Brieven: Een oproep", lists in the appendix "Lijst van gezochte brieven", five letters from LEEUWENHOEK that have not been traced. The first is noted in an 1897 auction catalogue listed at Bibliopolis.nl, Verzcat 7916. The final three may be manuscripts of already known letters. This is how they are described by VAN RIJNBEEK:

"14 Compagnie, Oost-Indische 1696 Uit collectie VITRINGA of BAART DELA FAILLE in 1897 door MULLER geveild. 7 pg. Folio".

"42 Prof ... 1700, 16 April".

"45 Bibliotheca Te Wateriana, veiling bij S. en J. LUCHTMANS, Leiden, 28 October 1823. Bldz. 2I, no. 53: scriptores in quibus A. van LEEUWENHOECK" ("writers including LEEUWENHOEK").

"46 MSS-veiling, bij C. WEDDEPOHL, Amsterdam, 22 Oct. 1850. Bldz. 13, no. 67: Eigenhandige brief van LEEUWENHOECK".

"47 Catalogus van een historischen Atlas der Nederlanden van A. J. VAN EINDHOVEN. Veiling bij W. THIEME, Zutphen, 19 Mei 1862. Bldz. 83, no. 2314: Verz. autogrammen, waaronder van LEEUWENHOECK".

## PREFACE TO VOLUME 20

LEEUEWENHOEK bequeathed to the Royal Society and that his daughter sent to them after his death.

Finally, volume 20 has two relevant documents written by others: the notary act documenting the medal presented to LEEUEWENHOEK in 1716 from the faculty at the *studium generale* (university) in Louvain and the 1723 *Philosophical Transactions* article by Royal Society vice-president Martin Folkes describing and discussing the 26 bequeathed microscopes.

Only a few of the letters in volume 20 have scientific observations and discussions. Letter 45 L-083 of 11 May 1679 to VAN VELTHUYSEN discusses the figures of plants visible in seeds, spiral vessels in seeds, in wood, and in other parts of plants, mould on old leather and its formation, and leucorrhoea. Letter L-143 of 26 October 1683 to ASTON discusses the cicatrix in the yolk of eggs. Letter L-155 of 13 February 1685 from MOLYNEUX to ASTON discusses LEEUEWENHOEK's microscopes. In Letter L-169 of 12 March 1686, THOMAS GALE explains the Society's reaction to one of LEEUEWENHOEK's letters about cotton seeds, sweat pores, eels, and the mixture of fluids in blood. In Letter L-502 of 3 March 1714, WALLER discusses muscles in insects.

In Letter L-338 of 21 March 1698, Leiden professor GOVERT BIDLOO sends LEEUEWENHOEK a thorough study of the worms found in a sheep's liver and its nearby parts. He argues against the practices of quacks and many physicians who do not reason from evidence and mistake the symptoms of diseases for their causes. Given the long length of BIDLOO's letter, only a new English translation has been included.<sup>2</sup>

The 23 letters in this volume from Italian librarian ANTONIO MAGLIABECHI include transcriptions and translations of the 14 of them published in *De Boekzaal van Europe* and one in *Twee maandelijke uittreksels* (Twice monthly extracts). They mostly contain publication data and summaries of books recently published in Italy in Italian and Latin. This volume includes only a list of the authors, titles, publishers, and dates of publication. The actual texts from *De Boekzaal* are not included because they are not important for understanding LEEUEWENHOEK's work.

Only three of the letters in this volume are illustrated with figures, Letter 45 L-083 of 11 May 1679 to VAN VELTHUYSEN, Letter L-208 of 6 March 1690 from CHRISTIAAN HUYGENS and Letter L-338 of 21 March 1698 from BIDLOO. In addition, Letter 35 [22] L-060 of November 1677 from LEEUEWENHOEK to Royal Society president WILLIAM BOUNCKER has one figure that was missed when it was published in volume 2.

Sequencing letters between England and Holland during LEEUEWENHOEK's lifetime can be confusing because of the difference in dating systems. In 1582, the Republic's provinces of Holland (where LEEUEWENHOEK lived) and Zeeland adopted the new Gregorian Calendar, known as New Style (N.S.). It compensated for the inaccuracies of the ancient Julian calendar, known as Old Style (O.S.), by skipping ahead ten days. In 1700, another day was skipped to make the dates in Holland eleven days ahead of those in England, which retained the Julian calendar until 1753. Because letters between Delft and London often arrived three or four days after they were written, they were then read on a date in London before the date in Delft on which they were addressed.

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<sup>2</sup> For a facsimile of the Dutch text published by HENDRIK VAN KROONEVELT in Delft and often found bundled with LEEUEWENHOEK's *Sevende Vervolg der Brieven* (1702), also published by VAN KROONEVELT, see JANSEN, (ed.), *Letter from G. Bidloo to Antony Leeuwenhoek* (1972).

## PREFACE TO VOLUME 20

In addition, Holland also in 1582 adopted 1 January as the beginning of the year, while England retained the old 26 March beginning. As a result, dates between them are sometimes expressed as, for example, 'Feb 16<sup>th</sup> 1682/3' at the end of ASTON's Letter L-123.

In order to clarify the workings of LEEUWENHOEK's network of correspondents, many in England, the dates of all of the letters themselves in this volume are expressed in New Style dates.

Volume 20 continues the editorial policies that developed when the Leeuwenhoek Commission, mostly composed of scientists, was gradually replaced by historians of science. The footnotes are mostly historical, not scientific<sup>3</sup>, references to present-day concepts (which often emerged after the nineteenth century) are minimized, the letters are formatted consecutively instead of side-by-side, the figures are included within the text of the letters, and the numbering follows the scheme of the new L-numbers initiated with volume 18.

A new policy was needed to keep this volume manageable. The text of volume 20 is entirely in English, except for the contemporary Dutch texts by LEEUWENHOEK himself.

Volume 20 concludes with 18 appendices. The first 13 contain a complete list of the letters between LEEUWENHOEK and those who corresponded with him most often, in chronological order of their first letter to or from LEEUWENHOEK. Next to each letter number and date is a brief list of the contents of that letter.

- 1 - CONSTANTIJN HUYGENS
- 2 - HENRY OLDENBURG
- 3 - ROBERT HOOKE
- 4 - FRANCIS ASTON
- 5 - ANTHONIE HEINSIUS
- 6 - ANTONIO MAGLIABECHI
- 7 - RICHARD WALLER
- 8 - PIETER RABUS
- 9 - FREDERIK ADRIAAN VAN REEDE
- 10 - HANS SLOANE
- 11 - GOTTFRIED LEIBNIZ
- 12 - JOHN CHAMBERLAYNE
- 13 - JAMES JURIN

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<sup>3</sup> See the book review by WOLFE, "Leeuwenhoek. The Collected Letters. Volume VI": "There are, moreover, compelling arguments, developed elsewhere by KUHN and HANSON, which indicate the fallaciousness of regarding an observation couched in one descriptive vocabulary (LEEUWENHOEK's 'combination of tiny veins') as a presage or 'discovery' of later statements ('an epidermis built up from cells') relevant to an entirely different conceptual context. It is regrettable that the perfectly honest and well-meant tendency of the editing Commission to award priority to LEEUWENHOEK by detecting modernity and prescience in his observations happens to obscure the fundamental problem of conceptual innovation in the history of microscopical science. We shall understand LEEUWENHOEK's observations most fully, not by enumerating the possible modern equivalents of their microscopical objects, but by attempting to grasp their profoundly different conceptual implications. Let the student of LEEUWENHOEK abandon the jejune business of establishing priority and analyze instead the important sense in which LEEUWENHOEK and the modern cytologist see wholly different structures in the skin of an eel."

## PREFACE TO VOLUME 20

An additional three appendices bring together supplemental information. Appendix 14 lists all of the people who were part of the Leeuwenhoek Commission that supervised publication of the first 14 volumes of *Alle de Brieven / Collected Letters*, as well as the editors, transcribers, and translators for all 20 volumes. It does not include the names of the dozens of experts who wrote the scientific footnotes; those names are found in the appendices to the individual volumes.

Appendix 15 lists all contemporary editions of the book volumes containing the 165 letters that LEEUWENHOEK chose to publish himself. They were printed in Leiden and Delft in Dutch and Latin translation between 1684 and 1730.

Appendix 16 lists all of the known visitors to LEEUWENHOEK's house. The letters and other sources yield a total of 99 named visitors and scores of unnamed visitors, from "gentleman amateurs" and "curious persons" to "eminent persons" and the "ambassador of a crowned head". They demonstrate the extent of LEEUWENHOEK's fame as well as the breadth and depth of his network.

Appendix 17 has the usual list of all of the printed sources cited in the footnotes and Remarks for the letters in volume 20. Finally, Appendix 18 has a chronological list of all of the 602 letters, 392 written by LEEUWENHOEK and 193 written to him from 83 different correspondents including six who wrote directly to London and two who wrote relevant documents.

As a concordance, Appendix 18 lists the new L-number for every letter and, where applicable, the 192 letters numbered by LEEUWENHOEK and the number and volume of each in *Collected Letters*.

Finally, Appendix 19 list all of the correspondents involved in these 20 volumes of Leeuwenhoek Letters.

For their contributions to the translation of Latin letters in this volume, the editors would like to thank LEO NELLISSEN (L-066), MAURITS VAN WOERCOM (L-101), and HENK NELLEN (L-338). In the long tradition of the Royal Society's assistance with this project, KEITH MOORE, head of the Royal Society's Library and Information Services, patiently and thoroughly responded to our editorial concerns and made available many of the original documents.

Our final thanks go to the Huygens Institute, the long-time sponsor of this project, to all of the former members of the Leeuwenhoek Commission, and to our predecessors as editors. We hope that we have done justice to the work of the curious, industrious microscopist from Delft.

Amsterdam, November 2024.

DOUGLAS ANDERSON, LODEWIJK PALM, LIZZY ENTJES & HUIB ZUIDERVAART  
Huygens Institute  
Royal Netherlands Academy of Arts and Sciences – KNAW

## Collected Letters





## ADDITIONAL LETTERS TO PREVIOUS VOLUMES

- Letter:* **L-000 of 28 April 1673**
- Addressed to:* HENRY OLDENBURG.
- Written by:* REINIER DE GRAAF.
- Manuscript:* The manuscript of this Latin letter is to be found in London, Royal Society, Early Letters G1.11, 1 p. On the cover is written: “A Monsieur (2x) GRUBENDOL.<sup>1</sup> A Londres”.
- Published in:* A. LEEUWENHOEK 1673: “A Specimen of some Observations made by a Microscope, contrived by M. Leewenhoeck in Holland, lately communicated by Dr. Regnerus de Graaf”, *Philosophical Transactions*, vol. 8, no. 94 (19 May), p. 6038. (Summary).  
C. DOBELL, 1932: *Antony van Leeuwenhoek and His “Little Animals”* (Amsterdam: Swets & Zeitlinger), pp. 40-41. (Second paragraph).  
A. RUPERT HALL and MARIE BOAS HALL (eds.), *The Correspondence of Henry Oldenburg*, vol. IX, no. 2209, p. 602-603.
- Summary:* In this letter, DE GRAAF explains the two enclosed documents: first, his own pamphlet, *Partium genitalium defensio* (Defense of the genitals)<sup>2</sup>; second, a letter from his neighbour L., whose self-made microscopes surpass the so far best known. He invites OLDENBURG to test L.’s skill as a microscopist.
- Remarks:* This letter was read at the N.S. 7 May 1673 meeting of the Royal Society. In the following number of *Philosophical Transactions*, OLDENBURG published L.’s letter, L-001 of 28 April 1673, preceding it with his own summary of DE GRAAF’s letter:

The person communicating these Observations, by and by to be delivered, mentions in a Letter of his, written from *Delph* April. 28.1673, that one Mr. *Leewenhoeck* hath lately contrived Microscopes excelling those that have been hitherto made by Eustachio *Divini* <sup>3</sup>and others; adding, that he hath given a *specimen* of their excellency by divers Observations, and is ready to receive difficult tasks for more, if the Curious here shall please to send him such: Which they are not like to be wanting in.

OLDENBURG did not respond to DE GRAAF’s invitation until a year later, Letter L-010 of 4 May 1674, in this volume.

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<sup>1</sup> The anagram ‘Grubendol’ was OLDENBURG’s wartime code name.

<sup>2</sup> *Partium genitalium defensio* was DE GRAAF’s rebuttal to accusations by JOHANNES SWAMMERDAM (1637-1680) that DE GRAAF had improperly taken credit in his *De mulierum organis generationi inservientibus tractatus novus* (1672) for SWAMMERDAM’s own discoveries about the importance of the ovaries in reproduction. The Royal Society settled the dispute by awarding priority to NICOLAS STENO. See COBB, *The egg and sperm race*.

<sup>3</sup> EUSTACHIO DIVINI (1610-1685) was an Italian maker of optical instruments, whose lenses for microscopes and telescopes were reputed to be the world’s best.

## ADDITIONAL LETTERS ...

*Text of the letter:*

Clarissimo Viro HENRICO OLDENBURGIO  
Regiae Societatis Secretario  
S.P.

Grata et accepta mihi fuit epistola vestra 15 martis ad me missa eo que magis cum sub praelo haberem tractatulum quemdam Regiae Societati dicatum cuius exemplar: modo ad vos mitto: spero fore tractatulum illum vobis non ingratum fore, cum non ad inferendas sed ad retorquendas iniurias, et veritatem confirmandam illum publici iuris fecerim.

Edidit nuper etiam tractatum satis amplum (in 4 FREDRICUS DECKERS *De Exercitationibus Medicinae Practicis*), in quo multa remedia ab aliis proposita et circa medendi methodum notata diligenter conegit.

Ut vero adhuc magis vobis pateat necdum exulare hic propter armorum strepitum studi humaniora et philosophica, vobis in praesentiarum communicabo quod vir quidam ingeniosissimus nomine LEEWENHOECK excogitaverit microscopia, quae longe superant ea quae ab EUSTACHIO DIVINO et aliis hactenus fabrefacta vidimus, cuius specimen vobis dabit adiunxta eius epistola, in qua nonnulla a se accuratius quam ab aliis autoribus observata refert, quae si vobis arrideant et diligentissimi illius viri dexteritatem promovere et experiri velitis epistolam aliquam vernacula conscriptam de modo propositis ad illum scribite et difficiliora quaedam circa illam materiam occurrentia ei proponite.

hisce valete et amore pristino diligite

Vestrum Famulum  
REGNERUM DE GRAAF

Raptim Delphis  
28 Aprilis 1673

*English translation<sup>4</sup>:*

Many greetings to the famous HENRY OLDENBURG  
Secretary of the Royal Society

Your letter to me of 15 March was the more welcome and acceptable to me because I had in press a certain little tract dedicated to the Royal Society of which I now send you a copy; I hope this little tract will not be unwelcome to you as I have set it before the public not in order to wrong anyone but to repair wrongs done and vindicate the truth.

There has lately been published, too, a pretty ample treatise (in FREDERICK DECKERS<sup>5</sup> four essays on medical practice) in which many remedies proposed by others and notes on the method of effecting cures have been diligently compiled. So that it may be clear to you that humane and philosophical studies are not yet banished from this place

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<sup>4</sup> The (partial) translation by DOBELL varies slightly from the one presented in the *Correspondence of Henry Oldenburg*, used here.

<sup>5</sup> FREDERICK DEKKERS (1644-1720) was a Dutch physician in Leiden. DE GRAAF refers here to his *Exercitationes practicae circa medendi methodum, auctoritate, ratione, observationibusve plurimis confirmatae* (Lugd. Bat., 1693). DEKKERS was then appointed professor of medicine at the University of Leiden in 1694.

by the din of war,<sup>6</sup> I will communicate to you at this present time what a certain very ingenious person named LEEUWENHOEK has achieved by means of microscopes which far excel those we have seen hitherto made by EUSTACHIO DIVINI and others, of which his enclosed letter (in which he reports several things observed more accurately by himself than by other writers) will give you a specimen.

If you bless this, and wish to encourage and try out the dexterity of this most diligent person, write him a letter in the vernacular about the [matters] now proposed and propound to him some pretty hard questions] that crop up in that subject.

With this, farewell and favour with your former affection

Your servant  
REGNIER DE GRAAF

In haste, at Delft.  
28 April 1673

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<i>Letter:</i>	<b>L-004 of February 1674</b>
<i>Written by:</i>	CONSTANTIJN HUYGENS.
<i>Manuscript:</i>	This letter is known only by reference in another letter.
<i>Summary:</i>	In this letter, CONSTANTIJN HUYGENS encloses an extract of a letter from HENRY OLDENBURG that asks HUYGENS to encourage L.'s nature study.
<i>Source:</i>	Letter 5 [3] L-006 of 7 April 1674 to HENRY OLDENBURG.
<i>Remarks:</i>	This letter is the first known letter from HUYGENS to L. In total, their known correspondence over the eleven years up to December 1685 includes seven letters from HUYGENS to L. and seven letters from L. to HUYGENS. However, they lived just a few miles apart and visited each other often.

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<i>Letter:</i>	<b>L-007 of 11 April 1674</b>
<i>Written by:</i>	CONSTANTIJN HUYGENS.
<i>Manuscript:</i>	This letter is known only by reference in another letter.
<i>Summary:</i>	In this letter, CONSTANTIJN HUYGENS responds to L.'s letter of 5 April 1674. HUYGENS also tells L. that he will forward that letter to his son CHRISTIAAN and that he would like to receive more letters from L.
<i>Source:</i>	Letter 7 L-009 of 24 April 1674 to CONSTANTIJN HUYGENS.

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<sup>6</sup> The Third Anglo-Dutch War was a naval conflict that lasted from March 1672, (the start of the Dutch *Rampjaar*, 'Disaster Year'), to February 1674.

## ADDITIONAL LETTERS ...

<i>Letter:</i>	<b>L-010 of 4 May 1674</b>
<i>Written by:</i>	HENRY OLDENBURG.
<i>Manuscript:</i>	This letter is known only by reference in other letters. It is calendared as Letter 2486 in <i>The Correspondence of Henry Oldenburg</i> , vol. X, June 1673–April 1674, ed. and tr. by A. RUPERT HALL and MARIE BOAS HALL, p. 568.
<i>Summary:</i>	In this letter, HENRY OLDENBURG writes to L. that his observations are acceptable to the Royal Society and that ROBERT BOYLE wants L. to investigate why blood turns red when exposed to air. He encloses two numbers of <i>Philosophical Transactions</i> .
<i>Sources:</i>	Letter 8 [4] L-011 of 1 June 1674 to HENRY OLDENBURG. Letter 35 [22] L-060 of November 1677 to WILLIAM BROUNCKER.
<i>Remarks:</i>	<p>This letter is the first to L. from HENRY OLDENBURG (1615?-1677), after L. had already sent five letters to him. In total, the correspondence between L. and OLDENBURG, one of the founders of the Royal Society and the owner and editor of its journal, <i>Philosophical Transactions</i>, over the four years up to OLDENBURG's death in September 1677 includes 45 letters, 18 from OLDENBURG to L. and 27 to OLDENBURG from L., 11 of which OLDENBURG published in 12 articles in volumes 8 through 12 of <i>Philosophical Transactions</i>.</p> <p>For OLDENBURG, see a short biography published three months after his death, in BIRCH, <i>The History of the Royal Society of London</i>, vol. III, pp. 353-356.</p>

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<i>Letter:</i>	<b>L-013 of 30 August 1674</b>
<i>Written by:</i>	HENRY OLDENBURG.
<i>Manuscript:</i>	This letter is known only by reference in other letters. It is calendared as Letter 2531 in HALL and HALL, eds., <i>The Correspondence of Henry Oldenburg</i> , vol. XI, May 1674–September 1675, p. 71.
<i>Summary:</i>	HENRY OLDENBURG writes to L. in response to L.'s Letter 8 [4] of 1 June 1674 and Letter 9 [5] of 6 July 1674, praising his observations and passing along the compliments of ROBERT BOYLE.
<i>Sources:</i>	Letter 10 L-014 of 7 September 1674 to HENRY OLDENBURG. Letter 12 [7] L-016 of 19 October 1674 to HENRY OLDENBURG.

<i>Letter:</i>	<b>L-017 of 5 November 1674</b>
<i>Written by:</i>	HENRY OLDENBURG.
<i>Manuscript:</i>	This letter is known only by reference in other letters. It is calendared as Letter 2564 in HALL and HALL, eds., <i>The Correspondence of Henry Oldenburg</i> , vol. XI, May 1674–September 1675, p. 116.
<i>Summary:</i>	In this letter, HENRY OLDENBURG writes to L. that he has received L.’s recent letters. He relays greetings from ROBERT BOYLE and again encourages L. to continue sending his observations. He also asks for clarification about what L. meant by “musk” and about what kind of salt L. was observing.
<i>Sources:</i>	Letter 13 [8] L-018 of 4 December 1674 to HENRY OLDENBURG. Letter 18 [12] L-026 of 14 August 1675 to HENRY OLDENBURG.

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<i>Letter:</i>	<b>L-020 of 3 January 1675</b>
<i>Written by:</i>	HENRY OLDENBURG.
<i>Manuscript:</i>	This letter is known only by reference in another letter. It is calendared as Letter 2586 in HALL and HALL, eds., <i>The Correspondence of Henry Oldenburg</i> , vol. XI, May 1674–September 1675, p. 150.
<i>Summary:</i>	In this letter, HENRY OLDENBURG praises L. and passes along the greetings of THOMAS WILLIS. OLDENBURG expresses his doubts about L.’s finding globules in so many of the things he examined. He asks L. to reexamine the optic nerve because WILLIS and others had made observations of an optic nerve that did not agree with L.’s. OLDENBURG also asks L. to observe tobacco and tobacco seeds.
<i>Sources:</i>	Letter 15 [9] L-021 of 22 January 1675 to HENRY OLDENBURG. Letter 18 [12] L-026 of 14 August 1675 to HENRY OLDENBURG.

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<i>Letter:</i>	<b>L-023 of 1 March 1675</b>
<i>Written by:</i>	HENRY OLDENBURG.
<i>Manuscript:</i>	This letter is known only by reference in another letter. OLDENBURG wrote on L.’s Letter 15 [9] L-021 of 22 January 1675: “Answ. Febr. 19.1674½. Kept no Copy.” This letter is calendared as Letter 2614 in HALL and HALL, <i>The Correspondence of Henry Oldenburg</i> , vol. XI, May 1674–September 1675, p. 201.

## ADDITIONAL LETTERS ...

*Summary:* In this letter, HENRY OLDENBURG writes to L. that his two most recent letters were well received at the Royal Society. He notes that knowledgeable people in Paris disagreed with L.'s discovery of globules everywhere. Finally, he asks for better drawings of salt and suggests that the problem may lie in L.'s microscope.

*Source:* Letter 17 [11] L-024 of 26 March 1675 to HENRY OLDENBURG.

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*Letter:* **L-025 of 22 April 1675**

*Written by:* HENRY OLDENBURG.

*Manuscript:* This letter is known only by reference in L.'s reply. This letter is calendared as Letter 2643 in HALL and HALL, eds., *The Correspondence of Henry Oldenburg*, vol. XI, May 1674–September 1675, p. 275.

*Summary:* In this letter, HENRY OLDENBURG writes to L., acknowledging receipt of his letter of 26 March 1675 and praising him. He also recommends that L. ask other people to help him understand what he sees through his lenses

*Source:* Letter 18 [12] L-026 of 14 August 1675 to HENRY OLDENBURG.

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*Letter:* **L-027 of 22 August 1675**

*Written by:* HENRY OLDENBURG.

*Manuscript:* This letter is known only by reference in L.'s reply. This letter is calendared as Letter 2724 in HALL and HALL, eds., *The Correspondence of Henry Oldenburg*, vol. XI, May 1674–September 1675, p. 456.

*Summary:* In this letter, HENRY OLDENBURG writes to L. to acknowledge receiving his letter of 14 August 1675.

*Sources:* Letter 19 [13] L-028 of 20 December 1675 to HENRY OLDENBURG.  
Letter 35 [22] L-060 of November 1677 to WILLIAM BROUNCKER.

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*Letter:* **L-029 of 1676**

*Written by:* THEODORE CRAANEN.

*Manuscript:* This letter is known only by reference in another letter.

*Summary:* In this letter, L. writes to Leiden professor THEODORE CRAANEN about gold and mercury.

*Source:* Letter 45 L-083 of 11 May 1679 to LAMBERT VAN VELTHUYSEN.

*Remarks:* This is the only known letter from L. to CRAANEN, professor of medicine in Leiden, proponent of Cartesian theories, and frequent visitor to L.'s home. See Letter L-048 of 1677, in this volume, for CRAANEN's only letter to L.

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*Letter:* **L-030 of 7 January 1676**

*Written by:* HENRY OLDENBURG.

*Manuscript:* This letter is known only by reference in L.'s reply. This letter is calendared as Letter 2811 in HALL and HALL, eds., *The Correspondence of Henry Oldenburg*, vol. XII, October 1675 – July 1676, p. 116.

*Summary:* In this letter, HENRY OLDENBURG writes to L. in the French language that he assumes L. knows. OLDENBURG relates that the members of the Royal Society had no opinion about L.'s latest observations and that he would send more issues of *Philosophical Transactions*, but he fears the postage will be too expensive.

*Source:* Letter 20 L-031 of 22 January 1676 to HENRY OLDENBURG.

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*Letter:* **L-032 of 13 February 1676**

*Written by:* HENRY OLDENBURG.

*Manuscript:* This letter is known only by reference in L.'s reply. This letter is calendared as Letter 2836 in HALL and HALL, eds., *The Correspondence of Henry Oldenburg*, vol. XII, October 1675 – July 1676, p. 171.

*Summary:* In this letter, HENRY OLDENBURG writes to L. about a discussion of hair with ROBERT HOOKE, in which HOOKE'S ideas differed from L.'s. OLDENBURG also tells L. that he can expect *Philosophical Transactions*, numbers 113 and 117 and any future numbers to be sent by ordinary market boat to Rotterdam.

*Source:* Letter 21 [14] L-034 of 22 February 1676 to HENRY OLDENBURG.

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*Letter:* **L-033 of 20 February 1676**

*Written by:* HENRY OLDENBURG.

*Manuscript:* This letter, not calendared in *The Correspondence of Henry Oldenburg*, is known only by reference in L.'s reply.

## ADDITIONAL LETTERS ...

- Summary:* In this letter, HENRY OLDENBURG writes to L. in a letter forwarded by CONSTANTIJN HUYGENS along with some numbers of *Philosophical Transactions*, with the postage apparently pre-paid by OLDENBURG.
- Source:* Letter 22 [15] L-035 of 21 April 1676 to HENRY OLDENBURG.
- Remarks:* OLDENBURG's previous letter to L. is Letter L-032 of 13 February 1676, a week earlier, to which L. did not reply before he received the present letter. L.'s next letter, Letter 21 [14] L-034 of 22 February 1676, *Collected Letters*, vol. 1, is a reply to Letter L-032. L. did not reply to the present letter until two months later with Letter 22 [15] L-035 of 21 April 1676, *idem*, vol. 2.
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- Letter:* **L-036 of 14 May 1676**
- Written by:* HENRY OLDENBURG.
- Manuscript:* This letter is known only by reference in other letters. This letter is calendared as Letter 2895 in HALL and HALL, eds., *The Correspondence of Henry Oldenburg*, vol. XII, October 1675 – July 1676, p. 273.
- Summary:* Responding to L.'s recent inquiries, OLDENBURG writes to L. that his observations about hair agreed with ROBERT HOOKE's. Also, he has passed along to NEHEMIAH GREW L.'s remarks about GREW and the vessels in wood. He notes GREW's opinions on the shape of air vessels.
- Sources:* Letter 22 [15] L-035 of 21 April 1676 to HENRY OLDENBURG.  
Letter 23 [16] L-037 of 29 May 1676 to HENRY OLDENBURG.  
Letter 26 [18] L-040 of 9 October 1676 to HENRY OLDENBURG.
- Remarks:* GREW's observations differed from L.'s. In the next issue of *Philosophical Transactions*, no. 127, with a publication date of 18 July 1676, OLDENBURG added four pages (pp. 656-660) of notes about GREW's observations directly after the excerpt from L.'s letter that he translated himself.
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- Letter:* **L-041 of 13 February 1676**
- Written by:* HENRY OLDENBURG.
- Manuscript:* This letter is known only by reference in L.'s reply. This letter is calendared as Letter 2986 in HALL and HALL, eds., *The Correspondence of Henry Oldenburg*, vol. XIII, July 1676 – July 1681, p. 97.
- Summary:* In this letter, HENRY OLDENBURG writes to L. that his observations about the anatomy of trees in his letter of 21 April 1676 were well received by NEHEMIAH GREW. L.'s observations about the influence of air on ammonia and copper in his letter of 28 July 1676 were well received by



ROBERT BOYLE, to whom L. had addressed that letter. OLDENBURG also encloses a copy of *Philosophical Transactions*, no. 127, which contained the letter of 21 April.

*Source:* Letter 27 L-043 of 30 October 1676 to HENRY OLDENBURG

*Remarks:* In Letter 22 [15] L-035 of 21 April 1676, *Collected Letters*, vol. 2, L. wrote,

Monsieur CONSTANTIJN HUGENS of Zulichem was pleased to show me the Anatomy of trees written by Doctor GREW, and told me, that he had very ingeniously and learnedly discoursed upon that subject; though I, by reason of my unskillfulness in the English Tongue, could have little more than the contentment of viewing the elegant Cuts.

Because none of GREW's publications have the title "Anatomy of trees" and his *Anatomy of Plants* was not published until 1682, it is not clear to which publication L. refers.

*Letter:* **L-042 of 26 October 1676**

*Written by:* HENRY OLDENBURG.

*Manuscript:* This letter is known only by reference in another letter. This letter is calendared as Letter 2991 in HALL and HALL, eds., *The Correspondence of Henry Oldenburg*, vol. XIII, July 1676 – July 1681, p. 107.

*Summary:* In this letter, HENRY OLDENBURG writes to L. that he has received letter 26 [18] L-040.

*Source:* A note by OLDENBURG in French at the end of Letter 26 [18] L-040 of 9 October 1676 to himself: "“reçu le 9. Octob. st. v. 1676./Resp. le 16. Oct. d’avoir/reçu cette lettre, par/M. LEIBNIZ, mais non pas/encor considéré” (received on 9. Octob. st. v. 1676./Resp. on 16. Oct. of having / received this letter, by / M. LEIBNIZ, but not / yet considered).

*Remarks:* In October 1676, LEIBNIZ had recently arrived in England from Holland and was about to return to Germany via a visit to Dutch philosopher BARUCH SPINOZA in The Hague, only a few miles from Delft. Perhaps OLDENBURG used the occasion to send his 26 October acknowledgement via LEIBNIZ, who would have been very interested in the little animals that L. reported in his letter of 9 October.

*Letter:* **L-044 of 31 October 1676**

*Written by:* CONSTANTIJN HUYGENS.

*Manuscript:* This letter is known only by reference in L.'s reply.

## ADDITIONAL LETTERS ...

- Summary:* In this letter, CONSTANTIJN HUYGENS responds to the copy of L.'s October 1676 letter to HENRY OLDENBURG about little animals in infusoria that he is returning. HUYGENS is pleased by L.'s observations but wonders why he has structured it like a journal. He also tells L. that his son is going to translate the letter into French and send it to Paris.
- Source:* Letter 28 L-045 of 7 November 1676 to CONSTANTIJN HUYGENS.
- Remarks:* HUYGENS replied to Letter 7 L-009 of 24 April 1674, *Collected Letters*, vol. 1, with the present letter, with which he returned a copy of L.'s Letter 26 [18] L-040 of 9 October 1676, *idem*, vol. 2, about his series of experiments observing little animals in infusions. That implies another lost letter, but HUYGENS could have received the copy of Letter 26 [18] L-040 during one of his visits to L.'s house in Delft. He must also have asked why L. structured the letter as a narrative of his observations over six months.  
Even though HUYGENS was returning Letter 26 [18] L-040, in L.'s response, Letter 28 L-045 of 7 November 1676, *idem*, vol. 2, he summarizes its contents. The end of Letter 28 L-045 seems to imply that HUYGENS's son CHRISTIAAN is going to send his French translation of Letter 26 [18] L-040 to Paris. Instead, CHRISTIAAN translated the much shorter Letter 28, ending it with a comment implying that he had seen the little animals himself through L.'s microscope. For details, see an exchange of letters between CHRISTIAAN HUYGENS and L.: Letter L-050 of 9 February 1677, in this volume, and Letter 30 L-051 to HUYGENS of 15 February 1677, *ibidem*. For the French translation, see HUYGENS, *Oeuvres complètes*, vol. VIII, p. 22.

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- Letter:* **L-046 of 12 November 1676**
- Written by:* HENRY OLDENBURG.
- Manuscript:* This letter is known only by reference in another letter. This letter is calendared as Letter 3004 in HALL and HALL, eds., *The Correspondence of Henry Oldenburg*, vol. XIII, July 1676 – July 1681, p. 130.
- Summary:* In this letter, HENRY OLDENBURG writes to acknowledge that he has received L.'s letter L-042 of 26 October 1676 and that he will respond more fully as soon as possible.
- Source:* A note by OLDENBURG at the end of Letter 27 L-043 of 30 October 1676 to him.
- Remarks:* At the end of L.'s manuscript, OLDENBURG wrote in French: “rec. le 26. Oct. 76./resp. le 2. Nov. que/j'escriray plus amplement/au plustost” (received on 26. Oct. 76./responded 2. Nov. that I will write more fully as soon as possible).

<i>Letter:</i>	<b>L-048 of 1677</b>
<i>Written by:</i>	THEODORE CRAANEN.
<i>Manuscript:</i>	This letter is known only by reference in other letters.
<i>Summary:</i>	In this letter, Leiden professor THEODORE CRAANEN writes to L., requesting that his relative JOHAN HAM <sup>7</sup> be allowed to visit and see some of L.'s demonstrations.
<i>Sources:</i>	Letter 35 [22] L-060 of November 1677 to WILLIAM BROUNCKER. Letter 196 [113] L-349 of 17 December 1698 to HARMEN VAN ZOELEN.
<i>Remarks:</i>	This is the only known letter addressed to L. from THEODORE CRAANEN (1620-1690), professor of medicine in Leiden, proponent of Cartesian theories, and a frequent visitor to L.'s home. HAM visited L. in August 1677. On HAM's second visit, he brought a vial of semen in which he had observed little animals. See Letter L-029 of 1676, in this volume, for L.'s only known letter to CRAANEN.

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<sup>7</sup> Until recently very little was known about JOHAN HAM (Arnhem, 1654–1725), the first discoverer of spermatozoa. HAM enrolled at Leiden University as a student in philosophy on 16 September 1671, giving as his age 20 (four years older than he actually was). In August 1677 he was introduced to L. as a nephew of the medical professor THEODORE CRAANEN. Then, or at a later visit, HAM brought ejaculate from a gonorrhoea sufferer to examine under L.'s lens. In it, they found sperm, which L. reported to the Royal Society in a letter to WILLIAM BROUCKNER dated November 1677. Twenty years later, NICOLAAS HARTSOEKER wrote a book taking credit for discovering sperm. L. defended HAM's priority in a letter to HARMAN VAN ZOELEN. After completing his studies, HAM returned to Arnhem, where he practised medicine.

In 1683 HAM was sent to the court of Brandenburg in Berlin on behalf of the States-General. He remained there until 1699, when he returned to Arnhem to become representative of Gelderland to the States-General. He became also mayor of Arnhem, to which position he was appointed for the third time in 1723. He died two years later.

Until recently it had never been noticed that HAM was involved in the renovation of the so-called *Leiden Sphaera*, a large Copernican planetarium. This instrument was built in Rotterdam between 1665 and 1672, but was donated to Leiden University by an alumnus in 1713. That same year it was restored and put on display in the library. On the pedestal of the instrument a person who contributed to the restoration is credited. This man, very experienced "in astronomical studies", turned out to be "the excellent mathematician JOHANNES HAM, councillor in Arnhem, a very noble and very wise representative of the High Mighty States-General of the United Netherlands". The discoverer of spermatozoa is thus immortalised on the pedestal of the *Leiden Sphaera*, not because of his groundbreaking discovery, but honoured for his mathematical skills.

See: MUYS, *Investigatio fabricae*, p. 288 (note); Halbertsma, "Johan Ham"; LAMMERS, "Johan Ham, de ontdekker van de zaaddiertjes"; SCHUTTE, *Repertorium der Nederlandse vertegenwoordigers residerende in het buitenland*, p. 207; HOOIJMAIJERS & ZUIDERVAART, "The Sphaera Movens, nicknamed the Leyden Sphaera".

## ADDITIONAL LETTERS ...

<i>Letter:</i>	<b>L-049 of 1677</b>
<i>Addressed to:</i>	ROBERT BOYLE.
<i>Written by:</i>	ANTONI VAN LEEUWENHOEK.
<i>Manuscript:</i>	This letter is known only by reference in another source.
<i>Summary:</i>	“Lost letters dating from 1677 are as follows: No. 156 ‘Mr. Leeuwenhoek’. This is possibly the letter of 28 July 1676”.
<i>Source:</i>	HUNTER et al., eds., <i>The Correspondence of Robert Boyle</i> , vol. 4, p. 435.

*Remarks:* *The Correspondence of Robert Boyle, 1636-1691*, incorporating the unpublished work on BOYLE’s correspondence by WILLIAM WOTTON (1666-1727), notes six letters from L. to BOYLE and none in return. The first letter, Letter 25 [17] L-039 of 28 July 1676, and the final letter, Letter 112 L-203 of 12 January 1689, are in *Collected Letters*, vol. 2 and vol. 8. Letter L-191 of 6 August 1687 and the three lost letters, the present Letter L-049 of 1677, Letter L-064 of 1678, and Letter L-195 of 1688, are in this volume. See the Royal Society Boyle Papers 36.111, pp. 180-189 for WOTTON’s work, a chronological inventory of BOYLE’s letters.

Even though BOYLE, a founding fellow of the Royal Society, did not write directly to L., he regularly asked others to pass along his reactions and suggestions. L. mentions BOYLE and returns his compliments in the following letters, all but the final one written to HENRY OLDENBURG:

Letter 8 [4] L-011 of 1 June 1674: “Mr. BOILE advises me to continue them and especially to pay attention to the red, florid colour which blood acquires as soon as it is drawn from the veins and exposed to the air, and also to the blood under the surface, as being distinct from the other blood in colour, which hath encouraged me to prosecute such observations.”

Letter 10 L-014 of 7 September 1674: “I am very much obliged to you and to Mr. BOYLE for his undeserved affection towards me.”

Letter 12 [7] L-016 of 19 October 1674: “Yours of the 20th August, from which I learned of the undeserved affection of Mr. BOILE and yourself towards me, which leaves me under great obligations.”

Letter 13 [8] L-018 of 4 December 1674: “Please remember me to Mr. BOILE and thank him for not forgetting me.”. These four letters are in *idem*, vol. 1.

Letter 27 L-043 of 30 October 1676: “I was also pleased to learn that Mr. BOYLE agreed with my observations which I sent him with some misgiving. Please give this gentleman my humblest regards.” L. refers to Letter 25 [17] L-039 of 28 July 1676.

Letter 31 [19] L-054 of 23 March 1677: “I was not a little pleased to see that Mr. BOYLE and Mr. GREW sent me their remembrances.”

Letter 39 [25] L-073 of 31 May 1678 to NEHEMIAH GREW: “You showed my letters to Lord BOUNCKER, the president, Mr. BOYLE and other Gentlemen.” These three letters are in *idem*, vol. 2.

Letter 105 [60] L-194 of 28 November 1687 to the Royal Society: “Mr. ANTONIE HEINSIUS ... wrote to me from Westminster on 24th July/3rd August, 1685 that The Right Honourable ROBERT BOIJLE would be pleased if I examined, among other things, Cochineal,” *idem*, vol. 7.

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<i>Letter:</i>	<b>L-050 of 9 February 1677</b>
<i>Written by:</i>	CHRISTIAAN HUYGENS.
<i>Manuscript:</i>	This letter is known only by reference in L.’s reply.
<i>Summary:</i>	In this letter, CHRISTIAAN HUYGENS informs L. that his observations of little animals in spice infusions were well-received in France.
<i>Source:</i>	Letter 30 L-051 of 15 February 1677 to CHRISTIAAN HUYGENS.
<i>Remarks:</i>	<p>The observations that L. refers to in Letter 30 L-051 of 15 February 1677, <i>Collected Letters</i>, vol. 2, are those in his summary of his long and most famous letter, Letter 26 [18] L-040 of 9 October 1676, <i>ibidem</i>, which documented his months of observations of little animals in a variety of spice infusions. L. sent the summary to CHRISTIAAN HUYGENS’s father CONSTANTIJN HUYGENS in Letter 28 L-045 of 7 November 1676, <i>ibidem</i>. CHRISTIAAN translated that letter into French before he sent it to Paris, where four pages of it were published in <i>Journal des Sçavans</i>, vol. VI, dated 28 March 1678. HENRY OLDENBURG had translated and published less than half of it in <i>Philosophical Transactions</i>, vol. 12, no. 133, dated 25 March 1677. See also the Remarks to Letter L-040 from CONSTANTIJN HUYGENS to L. of 31 October 1676, in this volume.</p> <p>The letter about the louse is the lost Letter 29 L-047 of 27 November 1676 to HENRY OLDENBURG, <i>Collected Letters</i>, vol. 2.</p> <p>The present letter is the first that HUYGENS wrote to L., who replied with Letter 30 L-051. HUYGENS did not reply to it before L.’s next known letter to him, Letter 46 L-084 of 15 May 1679, <i>idem</i>, vol. 3, about the ciliary motion of some of the little animals that he had seen. In neither letter did he mention “two sorts of water”, so any letter describing them either was never sent or is lost. Ten years later, HUYGENS wrote his next known letter to L., Letter L-205 of 6 March 1689, in this volume.</p> <p>HUYGENS, son of poet and statesman CONSTANTIJN HUYGENS, was a prominent mathematician, physicist, astronomer, and inventor. After an initial period of skepticism in the 1670s, the HUYGENSES were soon vouching for L. in London and Paris and became his most important Dutch supporters. See, for instance, HUYGENS’s Letter L-223 to L. of 20 October 1692, <i>Collected Letters</i>, vol. 9, there unnumbered, which he ends, “We ought highly to commend and admire your labour and diligence in what you communicate to us, as a result of which the knowledge of Nature is increased and corrected daily.” In Letter 227 [139]</p>

## ADDITIONAL LETTERS ...

L-391 of 21 June 1701 to HANS SLOANE, *idem*, vol. 13, L. calls HUYGENS “my great friend”. The *ePistolarium* has over two dozen letters to or from CONSTANTIJN HUYGENS and his sons CHRISTIAAN and CONSTANTIJN JR. that refer to L.<sup>8</sup>

L. wrote three known letters to CHRISTIAAN HUYGENS: Letter 30 L-051 of 15 February 1677, *idem*, vol. 2, Letter 46 L-084 of 15 May 1679, *idem*, vol. 3, and Letter L-207 of October 1689, in this volume.

CHRISTIAAN HUYGENS wrote four known letters to L.: the present letter, Letter L-205 of 6 March 1689, and Letter L-208 of 6 March 1690, all in this volume, and Letter L-223 of 20 October 1692, *idem*, vol. 9, there unnumbered.

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<i>Letter:</i>	<b>L-052 of 22 February 1677</b>
<i>Written by:</i>	HENRY OLDENBURG.
<i>Manuscript:</i>	This letter is known only by reference in other letters. This letter is calendared as Letter 3060 in HALL and HALL, <i>The Correspondence of Henry Oldenburg</i> , vol. XIII, July 1676 – July 1681, p. 211.
<i>Summary:</i>	In the two letters that he dated the 12 <sup>th</sup> and 22 <sup>nd</sup> of February 1677 O.S., HENRY OLDENBURG writes to L. that his observations of water (Letter 26 [18] L-040 of 9 October 1676) were well received by the members of the Royal Society, although they find it hard to conceive of the quantity of little animals that L. claims to have seen. They also ask L. to further study muscles and brains. OLDENBURG also passes along the greetings of ROBERT BOYLE and NEHEMIAH GREW.
<i>Sources:</i>	Letter 31 [19] L-054 of 23 March 1677 to HENRY OLDENBURG. Letter 32 [20] L-056 of 14 May 1677 to HENRY OLDENBURG.
<i>Remarks:</i>	Prompted by OLDENBURG, in Letter 31 [19] L-054 of 23 March 1677, <i>Collected Letters</i> , vol. 2, L. explains his method for calculating the number of little animals. In Letter 32 [20] L-056 of 14 May 1677, <i>ibidem</i> , L. further examines muscles and brain, as the members of the Royal Society had requested.

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<i>Letter:</i>	<b>L-053 of 4 March 1677</b>
<i>Written by:</i>	HENRY OLDENBURG.
<i>Manuscript:</i>	This letter is known only by reference in other letters. This letter is calendared as Letter 3068 in HALL and HALL, eds., <i>The Correspondence of Henry Oldenburg</i> , vol. XIII, July 1676 – July 1681, p. 218.

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<sup>8</sup> <http://ckcc.huylgens.knaw.nl/epistolarium>

- Summary:* In the two letters that he dated 12 and 22 February 1677 O.S. (L-052 of 22 February 1677 N.S. and L-053 of 4 March 1677 N.S.), HENRY OLDENBURG writes to L. that his observations of water (Letter 26 [18] L-040 of 9 October 1676) were well received by the members of the Royal Society, although they find it hard to conceive of the quantity of little animals that L. claimed to have seen. They also ask L. to further study muscles and brains. OLDENBURG also passes along the greetings of ROBERT BOYLE and NEHEMIAH GREW.
- Sources:* Letter 31 [19] L-054 of 23 March 1677 to HENRY OLDENBURG.  
Letter 32 [20] L-056 of 14 May 1677 to HENRY OLDENBURG.
- Remarks:* In Letter 31 [19] L-054 of 23 March 1677, *Collected Letters*, vol. 2, L. explains his method for calculating the number of little animals. In Letter 32 [20] L-056 of 14 May 1677, *ibidem*, L. further examines muscles and brain, as the members of the Royal Society had requested.

- Letter:* **L-055 of 20 April 1677**
- Written by:* HENRY OLDENBURG.
- Manuscript:* This letter is known only by reference in L.'s reply. This letter is calendared as Letter 3088 in HALL and HALL, *The Correspondence of Henry Oldenburg*, vol. XIII, July 1676 – July 1681, p. 239.
- Summary:* In this letter, OLDENBURG writes a courtesy letter to L. from himself and the members of the Royal Society.
- Source:* Letter 32 [20] L-056 of 14 May 1677 to HENRY OLDENBURG.
- Remarks:* OLDENBURG's previous letter to L. is Letter L-053 of 4 March 1677. L.'s next letter, Letter 31 [19] L-054 of 23 March 1677, *Collected Letters*, vol. 2, responds to earlier letters of February and March; he never replies to the present letter. OLDENBURG's next and last letter is Letter L-057 of 7 August 1677.

- Letter:* **L-057 of 7 August 1677**
- Written by:* HENRY OLDENBURG.
- Manuscript:* This letter is known only by reference in another letter. This letter is calendared as Letter 3122 in HALL and HALL, *The Correspondence of Henry Oldenburg*, vol. XIII, July 1676 – July 1681, p. 330.
- Summary:* In this letter, HENRY OLDENBURG asks L. examine the skin of Moors. It was delivered by HENNIG BRAND, the Hamburg alchemist who discovered phosphorus, as a cover letter for *Philosophical Transactions*, no.

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136. BRAND delivered it to L. when he visited on 11 September 1677.

*Source:* Letter 33 [21] L-058 of 5 October 1677 to HENRY OLDENBURG.

*Remarks:* It was not until 1684 that L. found an opportunity to examine some skin that he scraped from the arm of a 13-year-old Moorish girl, as he reported in Letter 80 [41] L-147 of 14 April 1684 to FRANCIS ASTON, *Collected Letters*, vol. 4.

This is the final letter to L. from OLDENBURG, who died a month later. Not knowing that, L. addressed Letter 33 [21] L-058 of 5 October 1677, *idem*, vol. 2, to OLDENBURG.

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*Letter:* **L-060 of November 1677**

*Addressed to:* WILLIAM BROUNCKER.

*Written by:* ANTONI VAN LEEUWENHOEK.

*Manuscript:* There is no known manuscript. However, a 5-page copy of the letter is found in the Royal Society's Letter Book Original 8.5: "Copy letter from ANTHONY LEUWENHOECK to the Lord BROUNCKER Containing some Observations about Human Seed." It includes two marginal drawings of crystals found in semen, marked 'A' and 'B', made by the copyist in London.

*Summary:* L. writes to Royal Society president WILLIAM BROUNCKER about living sperm and their movements in fresh semen, as well as "vessels" and crystals in the semen.

*Figures:* This letter was published in *Philosophical Transactions*, vol. 12, no. 142, page 1042, with only Fig. A. In the copy, mentioned above, there is also a Fig. B that is not referred to in the printed letter.

*Remarks:* In *Collected Letters*, vol. 2, p. 277, Letter 35 [22] L-060 of November 1677, the manuscript of this letter is noted as "Not recovered" and no mention is made of the figures.

This letter is the second of three letters that L. wrote to BROUNCKER in the fall of 1677 after the death of HENRY OLDENBURG. The first is Letter 34 L-059 of 16 October 1677 and the third is Letter 36 L-061 of 2 December 1677, both in *ibidem*. For WILLIAM BROUNCKER (1620?-1684), see the Biog. Reg., *ibidem*, p. 441.





Figures A and B depicting crystals found in semen, labeled “A” and “B”, reproduced in Letter Book Original 8.5 at the Royal Society

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<i>Letter:</i>	<b>L-063 of 10 December 1677</b>
<i>Written by:</i>	ROBERT HOOKE.
<i>Manuscript:</i>	This letter is known only by reference in L.’s reply.
<i>Summary:</i>	In this letter, ROBERT HOOKE acknowledges the receipt of L.’s letter of November 1677 to WILLIAM BOUNCKER describing sperm in human semen.
<i>Source:</i>	Letter 37 [23] L-067 of 14 January 1678 to ROBERT HOOKE.
<i>Remarks:</i>	<p>This letter begins the correspondence between HOOKE and L., who had addressed letters only to HENRY OLDENBURG (and one letter to ROBERT BOYLE) until OLDENBURG’s death in September 1677. BIRCH’s <i>The History of the Royal Society of London</i>, vol. III, p. 347, notes that on 1 November 1677 O.S., “After the reading of these papers, Mr. HOOKE was ordered to return the Society’s thanks to Mr. LEEWENHOECK, and to endeavour to procure farther discoveries from him by holding correspondence with him.”</p> <p>L.’s Letter 37 [23] L-067 of 14 January 1678 to HOOKE continues, “But I wonder that in your Letter I find no mention made of my Observations of the second of December, St. No. also addressed to Lord BOUNCKER, which makes me doubt whether the same came to your hands.” In <i>Collected Letters</i>, vol. 2, p. 301, L.’s Letter 36 L-061 of 2 or 3</p>

## ADDITIONAL LETTERS ...

December 1677 is noted as having been addressed to only BROUNCKER.

HOOKE's next letter to L. is Letter L-065 of 11 January 1678, in this volume. Their correspondence consists of 28 letters, 12 from HOOKE to L. and one from both HOOKE and NEHEMIAH GREW to L. and 15 from L. to HOOKE.

Although they never met, HOOKE was the most important person in L.'s scientific career. L.'s first letter to the Royal Society extended several of HOOKE's observations from *Micrographia*. It was not until HOOKE was able to replicate L.'s observations of little animals for the members of the Royal Society in November 1677 that they accepted L.'s discoveries as true. When publication of *Philosophical Transactions* was suspended after the death of HENRY OLDENBURG, HOOKE published and responded to five of L.'s letters in his short-lived journal *Philosophical Collections*. HOOKE pushed for L.'s election to the Royal Society in 1680. A decade later, HOOKE wrote "Discourse concerning Telescopes and Microscopes", an assessment of microscopy at the end of the 17th century and praised L. as the microscope's "single votary, ... besides whom none make any other use of that instrument".

Beginning in 1679, HOOKE translated at least eight of L.'s letters. In Letter L-118 to L. of 26 March 1682 (dated 16 March 1682 O.S.), in this volume, HOOKE writes, "I have not exactly followed your letter word for word in the translation, but as near as possibly I could I have expressed the true sense of your expressions."

On 11 December 1683 O.S., he wrote in his diary, "begun to learn Dutch with Mr. BLACKBURNE". On the 13th December: "learnt Low Dutch".

On 25 January 1684 O.S., he wrote that he had received a Dutch book by NICOLAAS WITSEN, *Architectura Navalis Et Regimen Nauticum, ofte Aaloude en hedendaagsche scheeps-bouw en bestier* (Naval architecture and nautical government or ancient and contemporary shipbuilding and management).

Later, on 21 February 1684 O.S., he wrote, "Bought of Pots, Little Britain (Little Britainstreet): High Dutch bible, 2 low Dutch testaments 1 sh. Stevens mechanicks; Dutch 4 d. Dutch grammar and Dutch Corderius 3 d.", by which he meant a Dutch translation of *Colloquia Scholastica* (School colloquies) by MATURINUS CORDERIUS. HOOKE's diary, kept from 1672 to 1683, is found at The London Metropolitan Archives, CLC/495/MS01758.

Along with the lost cover letter, Letter 183 L-316 of 25 March 1697, *Collected Letters*, vol. 12, L. sent a copy of his *Continuatio Arcanorum Naturae* (Continuation of nature's secrets), which had 15 letters, only one of them to the Society. HOOKE prepared extensive summaries of all of the letters that he then read at meetings during the summer of 1697. The Royal Society and especially HOOKE wanted to keep current on L.'s research, even if it did not involve them. The summaries are to be found in London, Classified papers of the Royal Society, CLP/20/89.

*Letter:* **L-064 of 1678**

*Addressed to:* ROBERT BOYLE.

*Written by:* ANTONI VAN LEEUWENHOEK.

*Manuscript:* This letter is known only by reference in another source.

*Source:* M. HUNTER et al., eds., *The Correspondence of Robert Boyle*, vol. 5, p. 1.

*Remarks:* “Lost letters dating from 1678 are as follows: ... No. 170 ‘Msr. Leeuwenhoek’.”

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*Letter:* **L-065 of 11 January 1678**

*Written by:* ROBERT HOOKE and NEHEMIAH GREW.

*Manuscript:* This letter is known only by reference in L.’s reply to GREW.

*Summary:* In this letter, ROBERT HOOKE and NEHEMIAH GREW inform L. that due to ill health, WILLIAM BROUNCKER is being replaced as Royal Society president by JOSEPH WILLIAMSON.

*Source:* Letter 38 [24] L-070 of 18 March 1678 to NEHEMIAH GREW.

*Remarks:* L. addressed Letter L-069 of 14 February 1678 to WILLIAMSON, in this volume.

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*Letter:* **L-066 of 11 January 1678**

*Written by:* NEHEMIAH GREW.

*Manuscript:* No manuscript is known.

*Published in:* N. GREW 1679: ‘Auctoris ad Observatorem Responsum,’ *Philosophical Transactions*, vol. 12, no. 142, p. 1043.

*Summary:* In this letter, English botanist NEHEMIAH GREW passes along the greetings of Royal Society president Viscount BROUNCKER, who had asked GREW to write to L. GREW asks L. to compare the size and shape of sperm from a variety of animals. He contrasts the claims of WILLIAM HARVEY and REINIER DE GRAAF on the role of sperm in reproduction. GREW closes the letter by asking L. to further examine what he had reported as vessels in semen.

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### Remarks:

This is the first known letter from GREW to L., dated the same day as the letter that he and ROBERT HOOKE both signed. GREW's next letter to L. is Letter L-071 of 20 April 1678. He wrote a third and final letter, Letter L-075 of 13 October 1678. All three letters are in this volume.

The present letter was published in *Philosophical Transactions*, vol. 12, p. 1043, directly after the excerpt from L.'s Letter 35 [22] L-060 of November 1677 to BROUNCKER announcing his observations of sperm. It is followed by excerpts from L.'s next two letters, both to GREW, Letter 38 [24] L-070 of 18 March 1678, in which L. responds to GREW's letter in detail, and Letter 39 [25] L-073 of 31 May 1678, also about sperm. All three letters are in *Collected Letters*, vol. 2.

In addition, L. wrote four other letters to GREW. Letter 40 [26] L-074 of 27 September 1678, *ibidem*, discusses sweat-pores, saliva, and blood as well as a parasitic growth on grass affecting meadows outside Delft. Letter 42 [27] L-078 of 21 February 1679, *ibidem*, about blood, saliva, liver-flukes in sheep, and the sperm of cod, never reached the Royal Society. Letter 43 [28] L-080 of 25 April 1679, *idem*, vol. 3, discusses sperm of fish and birds, the testicles and sperm of a hare and of a dog, and calculations for determining the number of sperms in the milt of a cod. L.'s final letter, Letter 48 L-087 of 13 June 1679, *ibidem*, asks for acknowledgement of the letters of 21 February and 25 April 1679.

NEHEMIAH GREW (1641-1712) was one of the few researchers in the 17th century using the microscope, mostly on the anatomy and physiology of plants. Being also a member of the Royal Society and often publishing in *Philosophical Transactions*, he and L. commented on each other's observations, which sometimes differed. Upon the death of HENRY OLDENBURG, GREW edited the final six numbers of volume 12 of *Philosophical Transactions* and published three of L.'s letters: Letter 35 [22] L-060 of November 1677 to WILLIAM BROUNCKER and two letters to himself, Letter 38 [24] L-070 of 18 March 1678 and Letter 39 [25] L-073 of 31 May 1678, all in *ibidem*.

GREW got his medical degree from the Leiden University in 1671. Whether he knew enough Dutch to correspond with L. in that language, we do not know because none of his letters to L. have survived. See also G. VAN ITERSON, "A Discussion of Leeuwenhoek's Drawings and Descriptions in His Letter of 12 January 1680, as Compared with Those by Marcellus Malpighi and Nehemiah Grew of Corresponding Objects", *idem*, vol. 3, pp. 435-441.

*Text:*

Auctoris ad Observatorem Responsum

Cl. Vir,

Voluit Honoratiss Vice Comes BROUNCKERUS Te certum faciam Se tuas Literas, Nov datas, ex iisque haud mediocrem delectationem, accepisse. Qualem ex earum lectione me ipsum etiam affecisse agnosco. Proponerem, Domine, si non displicuerit, easdem Observationes in semine Brutorum, ut Canum, Equorum aliorumque, tentandas. Ea ratione, ut non solum quas fecisti ab omni posthac dubio melius vindices: verum etiam, si qua Animalculorum, vel quoad numerum, vel etiam figuram esset differentia, tuae sagaci investigationi innotesceret.

Quod ad Vasa attinet, quae Tibi saltem vidēris in parte seminis crassiori observasse; haerere me dubium non diffiteor. Quippe cum non videam, quorsum Natura istiusmodi Vasa fabricasset. Omnino enim negat noster HARVEIUS (lib de Generatione Animal) se unquam in Utero statim a Coitu dissecto, semen maris invenisse. Et Doctiss DE GRAFF (lib de partibus Faemin Gener dicatis) audacter & quantum ex propriis Observationibus intelligo rectissime asseruit, quod Testes Faemineae sint bina Ovaria; in quorum aliquo Ovo maxime maturo & per Tubam Fallopianam in Uterum illapso, Faetus efformatur. Adeo ut Semen Maris nihil aliud sit, quam Vehiculum Spiritūs cuiusdam summe volatilis ac animalis & conceptioni, i. e. Ovo Faemineo, contactum vitalem imprimētis.

Quare, & quae Tibi videbatur Vasorum congeries, fortassis, Seminis sunt quaedam filamenta, haud organice constructa, sed dum permearunt Vasa Generationi inservientia, in istiusmodi figuram Elongata. Non dissimili modo, ac saepius notatus sum salivam crassiorem, ex Glandularum Faucium foraminibus editam, quasi e convolutis fibrillis constantem. Quae de his ulterius experiri non gravatus fueris, avide spero me accepturum.

Vale.

Dat. Lond. cal. Jan. 1677/8.

## ADDITIONAL LETTERS ...

*English translation (by Leo Nellissen):*

Author's response to the observer.

Very famous gentleman,

The esteemed Viscount BROUNCKER<sup>9</sup> wanted me to inform you that he has received your letter of November, and that he has derived no small pleasure from it. I admit that something similar happened to me when I read it. I would suggest, sir, if it troubles you not, that the same perceptions should be tried on the seed of animals, such as dogs, horses, and other beasts. Considering that not only do the observations which you have made better protect you from any doubt hereafter, but also that if there is any difference in the small animals as to number or shape, that difference will become known through your shrewd examination.

Concerning the vessels, which you seem to have noticed at least for yourself in the fatter part of the seed, I do not deny that I continue to doubt, for I do not see for what purpose Nature had made such vessels. Our HARVEY, after all, completely denies (in his book on the conception of animals<sup>10</sup>) that he ever found male sperm in a womb that had been cut open immediately after intercourse. Also, the very learned DE GRAAF (in the parts of his book devoted to conception in females<sup>11</sup>) plainly and, as far as I understand it from typical observations, quite correctly asserts that the female testes are two ovaries. A fetus is formed in an egg thereof, which has fully matured and has passed through the fallopian tube into the uterus. So much so that the male seed is nothing but a vehicle of some spirit/spiritus which is very ephemeral and ensouled and which presses a life-giving touch on the conception (namely the female egg).

Therefore, what seemed to you a collection of vessels, perhaps, certain threads of seed, which have not come forth from growth, but, as they pass, the vessels at the service of procreation, are removed from such form. Not in an unequal way and more often I have observed oilier saliva, which was secreted through the openings of the tonsils in the throat and which consisted, as it were, of coiled fibres. You will not have declined to investigate this further; I sincerely hope to receive it.

Goodbye.

London, January 1, 1677/8

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<sup>9</sup> WILLIAM BROUNCKER was the president of the Royal Society from 22 April 1663 until he was succeeded by JOSEPH WILLIAMSON on 30 November 1677.

<sup>10</sup> WILLIAM HARVEY, *Exercitationes de Generatione Animalium. Quibus accedunt quaedam De Partu: de Membris ac humoribus uteri: & de Conceptione* (Exercises on the generation of animals to whom it may be concerned about birth: The membranes and fluids of the uterus and the conception), 1651.

<sup>11</sup> REINIER DE GRAAF, *De mulierum organis generationi inservientibus tractatus novus: demonstrans tam homines & animalia caetera omnia, quae vivipara dicuntur, haud minus quam ovipara ab ovo originem ducere* (A new treatise on the organs that serve the generation of women: showing that both men and animals all the other animals, which are called viviparous, originate not less than the oviparous egg), 1672.

- Letter:* **L-068 of 11 February 1678**
- Written by:* ROBERT HOOKE.
- Manuscript:* The manuscript of this English letter is to be found in London, Royal Society, Early Letters H3.54, 1 page. A copy is to be found in the Royal Society's Letter Book Original supplement 4 GH.30.86, pp. 367-368. It also has the date of 1 December 1677 and the title, "A letter from M<sup>r</sup> HOOKE to M<sup>r</sup> LEEUWENHOEK verifying his Observations of Animalcula in Pepper Water, and adding an account of others observed in the Infusions of several Grains in Rain-Water." The copyist changed some of Hooke's spelling and punctuation, which was probably what L. received in his copy.
- Published in:* Not published.
- Summary:* HOOKE writes to L. about how he verified L.'s observations of little animals in a pepper infusion as well as an account of other little animals observed in the infusions of several grains in rain water. He notes that the president and members of the Royal Society were surprised and satisfied.
- Remarks:* In the Royal Society's Early Letters, this letter is dated 1 February 1677/8 O.S. with the note, "Listed in 'Catalogue of Manuscript Letters' as December 1677." However, the manuscript has the date of "Dec. 1 1677".
- Text:*

S<sup>r</sup>

The papers you directed to y<sup>e</sup> Lord BOUNCKER were read at a full meeting of the Royall Society, and very kindly accepted by the members thereof: and they have ordered me to returne you both their thanks for so freely communicating yo<sup>r</sup> observations, and also an account of w<sup>t</sup> hath been here done in order to verify your observation concerning the small animalls you have first Discovered in Pepper water<sup>12</sup>.

Having steeped then in raine water pepper wheat barley oats pease and severall other grains, and having fitted up some microscopes, which had layne a long while neglected I having been by other urgent occasions diverted from making further inquiries w<sup>th</sup> that Instrument, I began to examine all those severall Liquors and though I could Discover Divers

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<sup>12</sup> Royal Society secretary and *Philosophical Transactions* editor HENRY OLDENBURG died on 15 September 1677, which L. was not aware of when he addressed Letter 33 [21] L-058 of 5 October 1677 to him. A week later, however, L. sent a cover letter to WILLIAM BOUNCKER, president of the Royal Society, Letter 34 L-059 of 16 October 1677, noting OLDENBURG's death and inquiring to whom he should now address his letters. The letter of 5 October 1677 was read at the 1 November 1677 O.S. meeting of the Royal Society. After the reading, the Society asked HOOKE to try again to reproduce L.'s observations of little animals and to be responsible for corresponding with him. See BIRCH, *The History of the Royal Society of London*, vol. III, p. 346-47. Before HOOKE could reply to L., the Royal Society received Letter 35 [22] L-060 of November 1677, in Latin, addressed to BOUNCKER, announcing L.'s discovery of sperm in human semen. All of these letters are found in *Collected Letters*, vol. 2.

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very small creatures swimming up and down in every one of these steepings and even in Raine it self, and that they had various shapes & differing motions, yet I found none soe exceedingly filled & stuffed as it were w<sup>th</sup> them, as was the water in w<sup>ch</sup> some cornes of pepper had been steeped. Of this the President & all the members present were satisfied, & it seem'd very wonderfull that there should be such an infinite number of animalls in soe imperceptible a quantity of matter. That these animalls should be soe perfectly shaped & endowed w<sup>th</sup> such curious organs of motion as to be able to move nimble, to turn, stay, accelerate & retard their progress at pleasure and It was not less surprising to find that these were gigantick monsters in comparison of a lesser sort which almost filled the water<sup>13</sup>.

S<sup>r</sup>. what further Discoveries my time will permitt to make I shall by the next send you. In the mean time (not Doubting but that you have many already by you, and that you will Dayly increase them) I doe hereby assure you that if you please to communicate any other to the RS by myne or any other hands you will very much oblige them & more particularly, yo<sup>r</sup> very great admirer and honoror.

RH.

from Gresham Colledge, Dec'r 1: 1677

You may please to Direct your Letter thus: To Mr. ROBERT HOOKE Secretary of the Royall Society at Gresham Colledg in London<sup>14</sup>.

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<i>Letter:</i>	<b>L-069 of 14 February 1678</b>
<i>Addressed to:</i>	JOSEPH WILLIAMSON.
<i>Written by:</i>	ANTONI VAN LEEUWENHOEK.
<i>Manuscript:</i>	This letter is known only by reference in another letter.
<i>Summary:</i>	The contents of this letter, which L. addresses to newly elected Royal Society president WILLIAMSON, is not specified in L.'s reference to it.
<i>Source:</i>	Letter 38 [24] L-070 of 18 March 1678 to NEHEMIAH GREW.
<i>Remarks:</i>	This letter is the only known letter from L. to WILLIAMSON, and there is no known reply. WILLIAMSON was the second president of the Royal Society, 1677 to 1680, preceded by WILLIAM BOUNCKER, 1662 to 1677, and succeeded by CHRISTOPHER WREN, 1680 to 1682. L. had addressed three letters to BOUNCKER in the fall of 1677 after the death of his regular correspondent HENRY OLDENBURG. GREW's request that L. address further correspondence to the new president WILLIAMSON must

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<sup>13</sup> On 15 November 1678 O.S., HOOKE was finally able to show the members of the Royal Society little animals in pepper water, just as L. had reported a year earlier in his letter of 9 October 1676, *ibidem*. See BIRCH, *The History of the Royal Society of London*, vol. III, p. 352. For HOOKE's more complete account of the events related to L. during the Society's meetings of November 1677, see The Hooke Folio Online, CELL/RS/HF\_107-112.

<sup>14</sup> L. would instead send his next six letters to the Royal Society to NEHEMIAH GREW.



have come in the lost Letter L-065 of 11 January 1678 that he and ROBERT HOOKE sent to L.

Previous to this lost letter, L. sent Letter 37 [23] L-067 of 14 January 1678 to HOOKE. After this lost letter, he sent Letter 38 [24] L-070 of 18 March 1678 to GREW. Both letters are in *Collected Letters*, vol. 2. He would continue sending letters to Royal Society secretaries GREW and then HOOKE instead of the president.

It is likely that this lost letter is a courtesy letter congratulating WILLIAMSON on his election as president.

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<i>Letter:</i>	<b>L-071 of 20 April 1678</b>
<i>Written by:</i>	NEHEMIAH GREW.
<i>Manuscript:</i>	This letter is known only by reference in other letters.
<i>Summary:</i>	In this letter, NEHEMIAH GREW writes that he has showed L.'s recent letters to his colleagues at the Royal Society. GREW's criticism of L. in his letter of 11 January was meant to stimulate his research. He continues that criticism by noting that REINIER DE GRAAF had seen female eggs in a fallopian tube
<i>Sources:</i>	Letter 39 [25] L-073 of 31 May 1678 to NEHEMIAH GREW.  Letter 40 [26] L-074 of 27 September 1678 to NEHEMIAH GREW.
<i>Remarks:</i>	GREW's previous letter to L. is Letter L-066 of 11 January 1678, in this volume. It was written in Latin, so L. must have had someone translate it for him because he replied with Letter 38 [24] L-070 of 18 March 1678, <i>Collected Letters</i> , vol. 2, in which he responds to GREW's letter in detail.

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<i>Letter:</i>	<b>L-072 of 28 April 1678</b>
<i>Written by:</i>	ROBERT HOOKE.
<i>Manuscript:</i>	The manuscript of this English letter is to be found in London, Royal Society, Early Letters H3.57; 1 page. A copy is to be found in London, Royal Society, Letter Book Original, supplement 4 GH.30.89, pp. 373-375, titled "D <sup>o</sup> 's Answer to M <sup>r</sup> Leeuwenhoek's Letter of Jan: 14: on Animalcula: w <sup>th</sup> some account of the Structure of a Muscle in Crabs, Lobsters &c." The copyist changed some of Hooke's spelling and punctuation, which was probably what L. received in his copy.
<i>Published in:</i>	Not published.
<i>Summary:</i>	In this letter, ROBERT HOOKE writes to L. in response to his Letter 37 [23] L-067 of 14 January 1678 about little animals in pepper water and

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mentions that King CHARLES II has seen them, too, with pleasure. HOOKE adds an account of his observations of the structure of muscles in crabs, lobsters, crawfish and prawns.

*Remarks:* HOOKE's previous letter to L. is Letter L-068 of 11 February 1678, to which L. did not respond, preferring instead to send his next five letters to the Royal Society to NEHEMIAH GREW. However, in Letter 68 [36] L-119 of 4 April 1682 to HOOKE, L. gives a loose translation of the final two paragraphs in the present letter, suggesting that either L. had the letter translated for him or he could read the English well enough himself. For another translation from English to Dutch around the same time, see Letter 76 [39] L-135 of 17 September 1683 to FRANCIS ASTON.

*Text:*

Sr.

Having not heard from you since I returnd you mine together w<sup>th</sup> the thanks of y<sup>e</sup> Royall Society for your excellent communications<sup>15</sup>, makes me suspect the miscarriage thereof. And this the more, because by a letter of yo<sup>rs</sup> w<sup>ch</sup> passed through my hands to D<sup>r</sup>. GREW I found noe mention thereof<sup>16</sup>. I doe here therefore againe reassure you of the very kind acceptance and thanks of the Royall Society for yo<sup>r</sup> Letter of the 14<sup>th</sup> of January Last<sup>17</sup>. And together w<sup>th</sup> them I have sent you the translate thereof into our Language. together w<sup>th</sup> some few observations and Collections of my own. which I had sent sooner, if I could have found an opportunity of conveying them. The prospect of these small animalls has given great satisfaction to all Persons that have viewed them. His Majesty<sup>18</sup> haveing been acquainted w<sup>th</sup> it, was desirous to see them, and very well pleased w<sup>th</sup> the Observation and mentiond your Name at the same time. I know not whether any of these ways I have here made use of for the Discovery of them may be in any thing like those w<sup>th</sup> w<sup>ch</sup> you make your observations. But I have two or 3 other ways w<sup>ch</sup> I shall shortly Communicate that doe far exceed those I have here mentiond.

About a month since I shewd the Society the fabrick and composition of a muscle some mention of w<sup>ch</sup> you will find in the inclosed treatise<sup>19</sup>, but not w<sup>t</sup> it was. I shall that I may not prepossess your Judgment only mention to you that the muscles that I chose were those of crabs, Lobsters, Crawfish or prawns And those especially of the great claws. if you Examine them I am sure you will find a fabrick w<sup>ch</sup> will very much please you and I doubt not but your opinion & observations will very much confirme mine. which when you have Examined, I would willingly understand I have not as yet settled my affairs soe well, as to prosecute the business of Correspondence for the Roy. Society soe fully as I determine to doe

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<sup>15</sup> HOOKE refers to his own Letter L-063 of 10 December 1677, in this volume.

<sup>16</sup> HOOKE refers to L.'s Letter 40 [26] L-074 of 27 September 1678 to NEHEMIAH GREW, *Collected Letters*, vol. 2.

<sup>17</sup> Letter 34 [23] L-067 of 14 January 1678, *ibidem*.

<sup>18</sup> CHARLES II reigned from the 1660 restoration of the monarchy until his death in 1685. After the Royal Society was founded in 1660, CHARLES granted it a royal charter in 1662.

<sup>19</sup> Not known. HOOKE's *Lectures and Collections*, published in 1678, does not mention anything about muscles of crabs, lobsters, crawfish, or prawns. At several meetings of the Royal Society in March and April 1678, HOOKE demonstrated features of muscles for the members. See BIRCH, *The History of the Royal Society of London*, vol. III.

w<sup>ch</sup> when I have I shall have much better opportunity to Gratify yo<sup>r</sup> curiosity w<sup>th</sup> some more pleasing communications. In the meane time w<sup>t</sup> occurs to my own observation that I conceive may not be unacceptable shall be sent you by S<sup>r</sup>.

R.H.

Ap: 18 1678  
Gresh. Colledge  
to M<sup>r</sup> Leeuwenhoeke

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<i>Letter:</i>	<b>L-075 of 13 October 1678</b>
<i>Written by:</i>	NEHEMIAH GREW.
<i>Manuscript:</i>	This letter is known only by reference in other letters to GREW.
<i>Summary:</i>	In this letter, NEHEMIAH GREW writes that the observations in L.'s Letter 39 [25] L-073 of 31 May 1678 were welcome to the Royal Society and that some would be printed, "as far as decency permits". GREW also tells L. that he has given the Letter 40 [26] L-074 of 27 September 1678 to the translator and promises to send <i>Philosophical Transactions</i> nos. 139 and 140, which had a description of a foetus found outside the mother's womb as well as a dropsical testicle of a woman.
<i>Sources:</i>	Letter 42 [27] L-078 of 21 February 1679 to NEHEMIAH GREW. Letter 48 L-087 of 13 June 1679 to NEHEMIAH GREW.
<i>Remarks:</i>	<p>The present letter is GREW's last known letter to L., although L. would send three more letters to GREW in response to his request in Letter L-066 of 11 January 1678, in this volume, that L. investigate sperm in a variety of animals. The letter that the Royal Society never received, Letter 42 [27] L-078 of 21 February 1679, <i>Collected Letters</i>, vol. 2, refutes the opinion that living organisms occur in blood or saliva and describes cod sperm. Letter 43 [28] L-080 of 25 April 1679, <i>idem</i>, vol. 3, describes sperm in cod, pike, hare, cock and dog as well as calculates their numbers. Finally, in Letter 48 L-087 of 13 June 1679, <i>ibidem</i>, L. asks GREW to acknowledge his letters of February and April. There is no record that he did so, but perhaps ROBERT HOOKE's lost Letter L-091 of August 1679, in this volume, did it for him.</p> <p>In L.'s Letter 51 L-092 to HOOKE of 13 October 1679, <i>ibidem</i>, he writes,</p> <p>I have sent three several [separate] letters to your colleague, Mr. NEHEMIAH GREW, without receiving a reply, to my great surprise. At one time I think the reason must be this Gentleman's many occupations, at another time I wonder whether illness may not be the cause, and then again I think the Royal Society may not have met. These ideas repeatedly entering my mind, I take the liberty to address this letter to you, requesting you to inform me whether my last letter, dated April 25th 1679, has come to hand.</p>

## ADDITIONAL LETTERS ...

<i>Letter:</i>	<b>L-076 of 23 December 1678</b>
<i>Written by:</i>	CONSTANTIJN HUYGENS.
<i>Manuscript:</i>	This letter is known only by reference in L.'s reply.
<i>Summary:</i>	In this letter, CONSTANTIJN HUYGENS writes to L. about the identification of little animals observed in pepper-water by his son CHRISTIAAN HUYGENS as well as the latter's description of the scales on the wings of butterflies.
<i>Source:</i>	Letter 41 L-077 of 26 December 1678 to CONSTANTIJN HUYGENS.
<i>Remarks:</i>	<p>For the context of the sequence of letters in late 1678 between CONSTANTIJN HUYGENS, his two sons, and L., see n. 1 to Letter 41 L-077 of 26 December 1678 to CONSTANTIJN HUYGENS, <i>Collected Letters</i>, vol. 2.</p> <p>HUYGENS's previous letter to L. is Letter L-062 of 8 December 1677, in which he noted the historical significance of L.'s discovery of sperm. L. included that letter in its entirety within Letter 196 [113] L-349 to Rotterdam merchant and politician HARMEN VAN ZOELLEN of 17 December 1698, <i>Collected Letters</i>, vol. 12, p. 259, there unnumbered. L. used that letter to defend the priority of his discovery of sperm over the recent claims of NICOLAAS HARTSOEKER to have been the first.</p> <p>L. did not reply to HUYGENS before he received the present letter, with which HUYGENS enclosed a set of drawings of little animals that his son CHRISTIAAN had observed in pepper-water and another set showing the scales on butterfly wings. In L.'s prompt response in Letter 41 L-077, he commented on each of CHRISTIAAN's drawings. From his description, his own lenses provided far greater resolution than CHRISTIAAN's.</p>

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<i>Letter:</i>	<b>L-079 of 12 April 1679</b>
<i>Written by:</i>	LAMBERT VAN VELTHUYSEN.
<i>Manuscript:</i>	This letter is known only by reference in L.'s reply.
<i>Summary:</i>	In this letter, Utrecht doctor and magistrate LAMBERT VAN VELTHUYSEN writes to L. about the arteries and nerves that VAN VELTHUYSEN mistakenly thought L. had discovered in blood. He returns L.'s "handwritten letters".
<i>Remarks:</i>	This letter is VAN VELTHUYSEN's first to L. His next letter to L. is Letter L-089 of 17 June 1679, in this volume. His return of L.'s "handwritten letters" indicates earlier correspondence, now lost. See Letter 45 L-083 of 11 May 1679 to VAN VELTHUYSEN, in this volume, for more on L.'s practice of enclosing notes and copies and asking for their return.

VAN VELTHUYSEN was a well-educated physician and liberal member of the Utrecht city council and a magistrate there. He wrote, mostly in Latin under the name VELTHUSIUS, about philosophical and theological subjects. He was also a fervent advocate of DESCARTES's ideas and he corresponded with SPINOZA.

The exchange of letters between VAN VELTHUYSEN and L. includes three other letters in 1679 from VAN VELTHUYSEN, all in this volume; L.'s prompt replies are all in *Collected Letters*, vol. 3: VAN VELTHUYSEN's Letter L-086 of June 1679 and L.'s reply, Letter 49 L-088 of 13 June 1679, in which he discusses the origin of life and complains about lack of appreciation by physicians and surgeons; his Letter L-089 of 17 June 1679 and L.'s reply, Letter 50 L-090 of 11 July 1679 about gout, Moxa, and bladder-stones; and his Letter L-093 of 18 October 1679 and L.'s reply, Letter 52 L-095 of 14 November 1679 about the tophi of gouty patients and the causes of gout, crystals of common salt and the beneficial effect of drinking tea.

For LAMBERT VAN VELTHUYSEN (1622-1685), see HOUTZAGER, "Lambert van Veldhuyzen en zijn contacten met geleerde tijdgenoten."

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<i>Letter:</i>	<b>L-082 of 4 May 1679</b>
<i>Written by:</i>	CONSTANTIJN HUYGENS.
<i>Manuscript:</i>	This letter is known only by reference in another letter.
<i>Summary:</i>	In this letter, CONSTANTIJN HUYGENS writes to L. that his son CHRISTIAAN's new book <i>La Dioptrique</i> is about to be published.
<i>Source:</i>	Letter 46 L-084 of 15 May 1679 to CHRISTIAAN HUYGENS.
<i>Remarks:</i>	The third part of CHRISTIAAN HUYGENS's <i>La Dioptrique</i> on telescopes and microscopes was not published until 1685. For an explanation of the delay, see n. 5 and n. 6 to L.'s Letter 46 L-084 of 15 May 1679 to CONSTANTIJN HUYGENS, <i>Collected Letters</i> , vol. 3.

CONSTANTIJN HUYGENS's previous letter to L. is Letter L-076 of 23 December 1678, in this volume, about little animals in pepper-water and the scales on the wings of butterflies. L. responded directly to each of HUYGENS's concerns in Letter 41 L-077 of 28 December 1678, *idem*, vol. 2. In Letter 44 L-081 of 27 April 1679, *idem*, vol. 3, also written to HUYGENS before the present letter, he discussed the size of particles of water and compared the size of the little animals that he saw to a grain of sand; he included his mathematical reasoning.

L. replied to the present letter with Letter 47 L-085 of 20 May 1679, *ibidem*, in which he continued his discussion in Letter 44 L-081, this time speculating on microscopic and submicroscopic dimensions, leading to the conclusion that the component parts (molecules) of water are unimaginably small.

## ADDITIONAL LETTERS ...

HUYGENS's next and last letter is Letter L-167 of 17 December 1685, in which he praises the historical importance of L.'s discovery of sperm. L. did not reply to that letter, but he included it in its entirety within Letter 109 [64] L-199 of 24 August 1688, *idem*, vol. 7, p. 361, there unnumbered.

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<i>Letter:</i>	<b>L-083 of 11 May 1679</b>
<i>Addressed to:</i>	LAMBERT VAN VELTHUYSEN
<i>Written by:</i>	ANTONI VAN LEEUWENHOEK.
<i>Manuscript:</i>	Signed autograph. The manuscript is located in the Special Collections Department of the Mariam Coffin Canaday Library, Bryn Mawr College, 3 folio pages, with drawings.
<i>Published in:</i>	Not published.
<i>Summary:</i>	In this letter, L. discusses the figures of plants visible in seeds, spiral vessels in seeds, in wood, and in other parts of plants, mould on old leather and its formation, and leucorrhoea. He explains the effects of dampness on mold, about which he had written in his first letter to HENRY OLDENBURG.
<i>Figures:</i>	The manuscript has two ink figures in the left margin, their crudeness indicating that they were drawn by L. himself. In the letter, he refers to them as seven different figures.
<i>Remarks:</i>	<p>This letter, the first that L. wrote to VAN VELTHUYSEN, is the text of Letter 45, <i>Collected Letters</i>, vol. 3, which was known in 1948 but considered lost. In the Remarks on p. 43, the existence of the letter is noted through 1875 and its contents is summarized, but "the manuscript evidently got lost; likewise, a copy." The manuscript has since been recovered and is included in this volume as the present letter.</p> <p>In the 1990s, <i>Collected Letters</i> editor LODEWIJK PALM learned that the manuscript was in the library of Bryn Mawr College (Pennsylvania, U.S.). According to a 13 December 1997 letter to Mr PALM from Professor JAMES R. TANIS, "The letter was given to the Library by the Frank Cutter Deering Trust about fifteen years ago." From the manuscripts librarian KATHLEEN WHALEN, Mr PALM received a letter dated 3 February 1998 with a copy of L.'s letter, photographs of the figures, and permission to publish them.</p> <p>VAN DE VELDE's "De brieven 1 tot 27 van Antoni van Leeuwenhoek", p. 326, n. 10, erroneously dates this letter 28 May 1679. L.'s next letter to VAN VELTHUYSEN is Letter 49 L-088 of 13 June 1679, <i>Collected Letters</i>, vol. 3.</p>

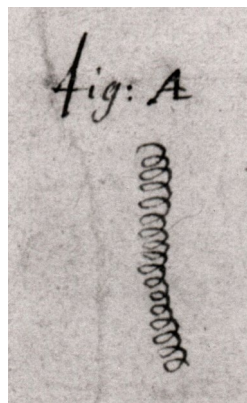
*Text:*

Delft den 11 en Meij 1679

D<sup>r</sup>Heer L: v: VELTHUYSEN  
Mijn Heer,

U. Ed: seer beleefden en aengenames vanden 12 April nevens mijne menuit missiven sijn mij te sijnder tijt wel geworden. De arterien, senuwen etc. bij anderen striemen genaemt, sijn bij mij noeyt int bloet, maer int mannelijk saet gesien, soo dat het bij U.Ed. qualijck verstaen off gelesen is.

Ick heb seer veel devoiren aengewent om was het mogelijk in een saet de figuer van een plant te sien, gelijck eenige geschreven hebben, hebbende int eerst gaen examineren de grooste saden als de karstanje, Aker, Boomen, erten, haesnoten, taruw etc. die ick selfs des swinters in nat sant heb laten schieten en deselve van dagh tot dagh geobserveert, maer daer inne niet [an]ders connen sien, als dat het meel vande grooste saden, bestonden uijt a 8 globulen, ende deselve globulen, weder uijt kleijne globulen, en wanneer de wasdom int Saet quam, de geseijde globulen in een effe materie veranderen en maeckten alsoo pijpjens, die niet anders int eerst en dienden als om de wortel te maecken; en daer beneffens quam ick oock te sien hoe alle de verdere globulen van het saet int ront lagen gestreckt, en geschickt omme de eerste globulen, waer uijt de pijpjens gemaectt waren te volgen, doch door de karstanje leggen verscheijde aderen, die ront gekrinckelt sijn, even als off wij een dun ijser off koper draatge, om een dun houtge hadden gewonden, en na de omwindinge het houtge uyt het ijser hadden getrocken, als fig: A.

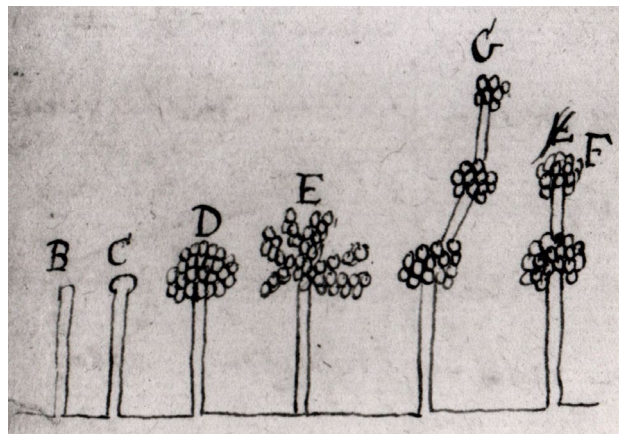


Dese aderen heeft oock den Haesnoot in sijn bast die om de pit leijt, item de Amandel, de peper in sijn witte bast, veel houten en planten, haer porien bestaen uyt soodanige gekrinckelde draatgens als oock mede bestaen de aderkens die wij met ons bloote oogh inde bladeren van boomen sien, uijt soodanige draatgens, en de groote ribbe van het blat, schijnt soo veel gekrinckelde draatgens in sich te hebben, als off het ijder bijsonder ribbetge daer van konde mede delen, doch uijt eenige bladeren die bij mij doorsocht sijn, besluit ick, datse alle soo sijn.

Ick heb inden jare 1672. aen de Coninckl. Societeit tot Londen geschreven van de figuer van het Schimmel, dat in ons oogh groen is, en dat ordinair op ouwe schoenen die niet gedragen worden, op geroockt Vlees, en etc. comt, maer ick sal hier nu mede bij voegen hoe ick mij imagineer dat het gemaectt wort.

## ADDITIONAL LETTERS ...

Het opperste vant leer, geroockt vlees etc. is hart en droogh en van binnen int leer, off vlees, is beslooten eenige vochticheijt, welke vochticheijt, met de minste veranderingh van warme lucht, door de opperste hardicheijt wordt uijt gestooten, en om dat dese eerste uijtwasemingh niet gemackelijck maar met geweld door de hardicheijt gestooten wort, en als uijt barst, soo is de uijtgestoote materie, inde eerste ueren aldergrootst, en om dat deselve uijt wasemde vochticheijt, ten merendeel uijt een lijmachtige substantie bestaet, soo stolt dese uijtgedreve materie aenstonts inde lucht, en maeckt alsoo een figuertge een stammetge van een boomt ge gelijk, als fig: B. Dit stammetge dus gemaeckt sijnde, blijft van binnen hol, en wanneer daer weder vochticheijt door het stammetge wort; gestooten, soo plaest het sich boven opt het selvige in een ront bolletge, als fig: C. waer van de superfities datelijck mede comt te stollen, ende alsoo dese uijtstotende vochticheit continueert, soo wort uijt het eerste bolletge het sij boven of ter sijden uijt, weder vochticheijt gestooten, die alle dan tot bolletgens w.erden, en alsoo een boomtge gelijk worden, als fig: D. en wanneer eijntelijck dese bolletgens in groote menichte toe nemen, soo scheuren sij wel van malkanderen als fig: E. en dit door microscope in Engelant gesien sijnde, hebben het voor Bloemkens met bladerkens aengesien, en afgebeeld. Oock comt het wel te geschieden, dat wanneer het boomken al gemaeckt is, dat noch een stameken door ongemene uijtstotingh van vochticheijt gemaeckt wort, en dat uijt dat tweede stammetge weder bolletgens voortcomen, als fig: F. en dan noch wel uijt het tweede boomtge een derde boomtge, (doch seer selden) als fig: G. Wat nu aengaet het schimmel dat lang is, en sich in onse oogen als wol vertoont, dat wiert uijt een lichaem voort gebracht, dat veel vochticheit in sich heeft, en welke vochticheit continuelijck wort uijtgestoten soo dat er geen tijt is, datter een bolleken kan gemaeckt werden, maer soo ras als r vochticheijt is uijt gestooten, dat tot een pijpken is gemaeckt, aenstonts van een continuele vochticheijt wort vervolgt, en daerom sodanich schimmel niet en bestaet, dan uijt lange pijpjens, de wol gelijk.



Ick heb over 6. à 7 jaren (onder anderen) het water daar antimonium in gelegen hadde observeert, maer mij en gedenckt niet, dat ick daer inne ijets heb be gesien dat noterens waerdich is, mijn voornemen is daer omtrent weder eenige observatieu te doen. Ick kan geen menschen in onse stadt die sodanich met de jicht gequelt zijn, dat de kalck de gewrichten uijt comt.

Ick heb soo nu en dan wel te kennen gegeven, dat ick het bloet van ongesonde menschen, etter, etc. genegen was om te sien, maer ick heb noijt t een of t ander becomen, en daerom is mijn voor nemen geen versoeck na dees tijt meer te doen.



'T is omtrent 6. à 7 jaren geleden dat mij door de Hr. ... geaddresseert was een Ciciliaens Edelman, die in dienst was den Hartogh van ... Aen desen klaeghden ick, dat ick binnen dese stad geen hulp hadd. Hier op wiert mij van den selven geantwoort. Ick verwondere mij niet, want de Hollanders sijn niet genegen als om gelt te winnen.

Wat het gout en quicksilver aen gaet daer van refereer ick mij tot mijn menuit missive, die ick inden jare 1676. daer over aen de heer Proffessor Cranen op desselfs versoeck heb geschreven.

Ick heb mijn selven altijts ingebeelt dat de witte vleet die de vrouwen hebben, uijt geen andere oorsaek en bestont, dan dat het bloet inde baarmoeder al te langh wiert opgehouden, en alleen door een bedervinge, een witte couluer hadde aen genomen, gelijk de fluijmen, en het snot uijt onse neus, niet anders als bloet bij mij en is geoordeelt, doch ik betwijffel off U.EE. mijne observatien daer omtrent sal gelesen hebben.

Om de urine van siecken te observeren, daer was veel arbeit aen vast, en daer beneffens een goet ervaren Doctor. Ick heb verscheijde malen mijn urine geobserveert, als ick gesont was, maer ongesont sijnde, en is bij mij geen lust tot observeren.

Mijn Heer dit ist geringe dat ick voor dees tijt op U.EE. aengename weet te seggen.

Hier nevens gaet, mijn menuit missive die ick wil hoopen dat U.EE. sal bevallen, en wanneer die bij U.EE. sal gelesen sijn versoeck ick dat deselve mij met den aldereersten magh te rugh gesonden worden. Blijve na presentatie van mijn dienst

Mijn Heer

U: E: onderdanige Dienaer

ANTONI LEEUWENHOECK.

*English translation:*

Delft the 11th May 1679<sup>20</sup>

To Sir L. v. VELTHUYSEN

Dear sir,

The very courteous and pleasant [letter] of Your Honour of the 12th of April, as well as my handwritten letters<sup>21</sup>, have actually reached me in due course. The arteries, nerves etc., which by other people are called fibres, have never been seen by me in blood, but in male semen, so that it has been wrongly understood or read by Your Honour<sup>22</sup>.

I have made every effort to see the figure of a plant in a seed, if that were possible, as has been described by some people. To begin with, I have for this examined the largest seeds, like the chestnut, acorn, beans, peas, hazelnuts, wheat, etc., which I have myself in wintertime made to take root in moist sand, and daily observed. But I have not been able to see in them anything other than that the meal of the largest seeds consisted of eight globules, and these same globules in their turn of small globules. When the seed began to grow, the said globules changed into a smooth matter, and so made little tubes, which served only to create the root to begin with. Besides that, I also managed to see how all the further globules of the seed lay arranged in a circle to succeed the first globules, out of which the little tubes

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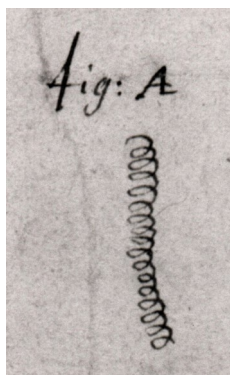
<sup>20</sup> This is L.'s first letter to VAN VELTHUYSEN.

<sup>21</sup> See note 57 below.

<sup>22</sup> VAN VELTHUYSEN's Letter L-079 of 12 April 1679, in this volume, is lost. He apparently initiated the correspondence with L.

## ADDITIONAL LETTERS ...

had been made. Yet through chestnuts run several veins, which are rolled up spirally, just as if we had wound a thin wire of iron or copper around a thin piece of wood, and after this wrapping around had pulled the piece of wood out of the iron, as in Fig. A. The hazelnut has also such veins in the rind that lies around the kernel. Likewise, the almond, the peppercorn in its white rind, and the pores of many kinds of wood and plants consist of such rolled-up threads. Likewise, the little veins that we see with our naked eye in the leaves of trees consist of such threads, and the large vein of the leaf seems to contain so many little rolled-up threads, as if it could impart them to each single little nerve. But from some leaves which have been investigated by me, I conclude that they are all like this.



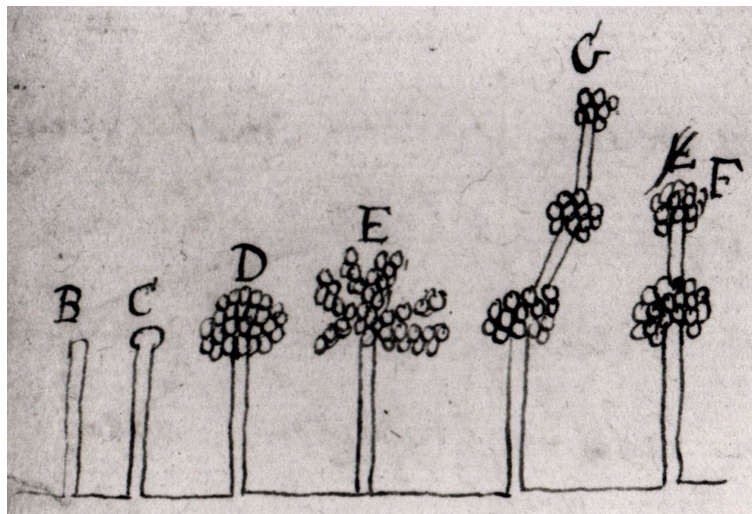
In the year 1672, I wrote to the Royal Society in London about the form of the mould which to our eyes seems green, and which usually appears on old shoes that are not used, on cured meat and etc<sup>23</sup>. But I shall here now also add how I imagine that this comes into being.

The surface of the leather, cured meat etc., is hard and dry. Within the leather, or meat, some moisture is enclosed, which moisture with the lightest change of temperature of the air is thrust out through the surface hardness. Because this first emanation is thrust through the hardness, not easily, but with force, it, as it were, bursts out. Hence the thrust-out matter is by far the largest in the first hours. Because this emanating moisture consists for the greater part of a glue-like substance, therefore this thrust-out matter immediately coagulates in the air and so creates a little figure resembling a little tree-trunk, as in Fig. B. This little trunk, having been created in this way, remains hollow on the inside. When again moisture is thrust through the little trunk, it puts itself on the top of the latter in a round little globule, as in Fig. C., the surface of which immediately coagulates as well. When this thrusting out of moisture continues, moisture is in its turn thrust out from the first little globule, either from its top or at its sides, all of which forms globules, and so come to resemble a little tree, as in Fig. D. When eventually these globules increase into a great number, they may be torn apart, as in Fig. E. People in England, who have seen this through a microscope, have regarded and depicted this as little flowers with leaves. It also may happen that when the little tree has already been created, yet one more little trunk is formed through an unusual thrusting-out of moisture. From that second little trunk again little globules come forth, as in Fig. F., and then from that second little trunk a third little tree (but this is very rare), as in Fig. G. As to the mould that is long, and appears in our eyes like fleece, this is brought forth by a substance

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<sup>23</sup> Letter 1 L-001 of 28 April 1673, *Collected Letters*, vol. 1. p, 29. L. remembered the year incorrectly.

that contains much moisture, and which moisture is thrust forth continuously, so that there is no time to make a globule. But as soon as moisture has been thrust forth and formed into a little tube, it is immediately succeeded by continuous moisture. Therefore, such a mould consists of nothing but long tubes, resembling fleece.



Six or 7 years ago, I (among other [experiments]) observed water in which antimony had been lying<sup>24</sup>, but I do not remember having seen anything in it that is worth noting down. It is my intention again to make some observations of this. I do not know people in our town who suffer so much from gout that the calcium comes forth from the joints.

At times, I have hinted that I would like to see the blood of unhealthy persons, pus, etc., but I have never been given either the one or the other, and therefore I intend from now on to ask for this no more.

It is about 6 or 7 years ago that a Sicilian nobleman, who was in the service of the Duke of ..., was referred to me by Sir ...<sup>25</sup>. I complained to this person that I did not receive any help within this town. On this I was answered by him: This does not surprise me, for the Dutch wish for nothing but to earn money.

<sup>24</sup> Perhaps he was referring to the observations he reported in Letter 16 [10] L-022 of 11 February 1675, *Collected Letters*, vol. 1, p. 231, only four years previously.

<sup>25</sup> In his letters, L. usually omitted the names of his visitors. In his 1950 biography of L., *Antoni van Leeuwenhoek, Zijn Leven en Zijn Werken*, ABRAHAM SCHIERBEEK speculates (vol. 1, p. 47) that this Sicilian nobleman could have been PAOLO BOCCONE (1633-1704), botanist to the Medici grand duke. According to a letter from HUYGENS to OLDENBURG, his speculation is correct. HUYGENS wrote, "I am about to obtain His Highness's passport for Mr BOCCONE, who leaves tomorrow for France and Italy, very well satisfied with a discussion he had all day yesterday with MR LEEUWENHOECK" (Letter 2497 of 22 May 1674 from CONSTANTIJN HUYGENS to HENRY OLDENBURG, HALL and HALL, *The Correspondence of Henry Oldenburg*, vol XI, p. 22). BOCCONE attended the meeting of the Royal Society on 7 May 1673 at which L.'s first letter to the Royal Society was received. See BIRCH, *The History of the Royal Society of London*, vol. III, p. 87.

## ADDITIONAL LETTERS ...

With regard to the gold and mercury, I refer to my handwritten letter, which I wrote in the year 1676 on this subject to Professor CRAANEN, at his request<sup>26</sup>.

I have always thought that the white discharge that occurs in females has no other cause than that the blood was far too long contained in the uterus, and merely through corruption had acquired a white colour, just as I judged that the phlegm and mucus from our nose was nothing but blood. But I doubt that Your Noble Honour will have read my observations on that subject<sup>27</sup>.

To observe the urine of ill people entails much effort, and moreover requires a good and experienced physician. I have several times observed my urine when I was in good health, but when I am unhealthy, I lack the energy for observing.

Dear sir, this is the trifling matter that at this moment I am able to say to please Your Honour.

Enclosed with this is my handwritten letter, which I hope will please Your Noble Honour, and when it shall have been read by Your Noble Honour, I ask that it may be sent back to me as soon as possible.

Having offered my service, I remain,  
Dear sir,  
The humble servant of Your Honour,

ANTONI LEEUWENHOECK.

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<i>Letter:</i>	<b>L-086 of early June 1679</b>
<i>Written by:</i>	LAMBERT VAN VELTHUYSEN.
<i>Manuscript:</i>	This letter is known only by reference in L.'s replies.
<i>Summary:</i>	In this letter, LAMBERT VAN VELTHUYSEN writes to L., returning what must have been copies of some of his letters. He asks L. to examine the chalky discharges from gouty skin. He also mentions his well-known controversy with the conservative supporters of the House of Orange, resulting in "contumely and insult".
<i>Sources:</i>	Letter 49 L-088 of 13 June 1679 to LAMBERT VAN VELTHUYSEN. Letter 50 L-090 of 11 July 1679 to LAMBERT VAN VELTHUYSEN.

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<sup>26</sup> For this lost letter, see Letter L-029 of 1676 to THEODOOR CRAANEN, in this volume. L.'s reference here to "my handwritten letter" may refer to a copy of the letter to CRAANEN as well as the "handwritten letters" in the first sentence. In the final sentence, he notes that he is again enclosing a "handwritten letter" to VAN VELTHUYSEN. L.'s next letter to VAN VELTHUYSEN, written a month later, begins, "I have received your kind letters together with my papers, from which I see the reasons, why you have kept them so long" and ends with a reference to another enclosure.

<sup>27</sup> No known letter written previously to this one discusses uterine discharges or human noses. Perhaps L. is referring to another of the "handwritten letters". It is not known whether these letters had been previously sent by L. to other correspondents.

*Remarks:* The previous letter from VAN VELTHUYSEN to L. is Letter L-079 of 12 April 1679, in this volume. L. replied with Letter 45 of 11 May 1679, *Collected Letters*, vol. 3, the text of which is Letter L-083 of 11 May 1679, in this volume. The present letter was written after that and before L.'s reply, Letter 49 L-088 of 13 June 1679. VAN VELTHUYSEN's next letter to L. is Letter L-089 of 17 June 1679, in this volume.

"Contumely and insult" refers to the treatment of VAN VELTHUYSEN by the Orangists and the Reformed clergymen in Utrecht, where he had been a magistrate (*schepen*). VAN VELTHUYSEN supported the republicans and was well-known for his liberal religious publications.

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*Letter:* **L-089 of 17 June 1679**

*Written by:* LAMBERT VAN VELTHUYSEN.

*Manuscript:* This letter is known only by reference in L.'s reply.

*Summary:* In this letter, LAMBERT VAN VELTHUYSEN writes to L. about procreation in such abstruse language that L. has difficulty understanding it.

*Source:* Letter 50 L-090 of 11 July 1679 to LAMBERT VAN VELTHUYSEN.

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*Letter:* **L-091 of August 1679**

*Written by:* ROBERT HOOKE.

*Manuscript:* This letter is known only by reference in another letter to HOOKE.

*Summary:* This letter from ROBERT HOOKE to L. apparently got lost in transit.

*Sources:* Letter 53 L-096 of 20 November 1679 to ROBERT HOOKE.

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*Letter:* **L-093 of 18 October 1679**

*Written by:* LAMBERT VAN VELTHUYSEN.

*Manuscript:* This letter is known only by reference in L.'s reply.

*Summary:* In this letter, LAMBERT VAN VELTHUYSEN writes to L. to explain his delay in responding and to affirm that he is still interested in learning about L.'s observations.

*Source:* Letter 52 L-095 of 14 November 1679 to LAMBERT VAN VELTHUYSEN.

*Remarks:* Earlier, in Letter L-086 of early June 1679, in this volume, VAN VELTHUYSEN asked L. to examine the chalky discharges from gouty skin.

## ADDITIONAL LETTERS ...

L. responded to VAN VELTHUYSEN's request in Letter 50 L-090 of 11 July 1679, *Collected Letters*, vol 3, about the tophi of a patient suffering from gout, in which L. discovered needle-shaped crystals. See also L.'s reply to the present letter, his last letter to VAN VELTHUYSEN, Letter 52 L-095 of 14 November 1679, *ibidem*, about the tophi of gouty patients and the causes of gout, in addition to the beneficial effects of drinking tea. L. sent a copy of that letter to ROBERT HOOKE a week later in Letter 53 L-096 of 20 November 1679, *ibidem*.

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<i>Letter:</i>	<b>L-094 of 27 October 1679</b>
<i>Written by:</i>	ROBERT HOOKE.
<i>Manuscript:</i>	This letter is known only by reference in other letters to HOOKE.
<i>Summary:</i>	In this letter, ROBERT HOOKE writes to L. that his previous letter was sent in August and that L.'s recent "slight observations and considerations" please him and his colleagues. He asks L. to examine fecund and sterile eggs and to look for spots on them. He promises to send current numbers of <i>Philosophical Transactions</i> .
<i>Sources:</i>	Letter 53 L-096 of 20 November 1679 to ROBERT HOOKE. Letter 54 [29] L-097 of 12 January 1680 to ROBERT HOOKE.
<i>Remarks:</i>	L.'s "slight observations and considerations" are in Letter 51 L-092 of 13 October 1679, which contains a copy of L.'s Letter 50 L-090 of 11 July 1679 to LAMBERT VAN VELTHUYSEN about gout and whether Moxa could cure it. The letter to VAN VELTHUYSEN that L. mentions in Letter 53 L-096 of 20 November 1679 is Letter 52 L-095 of 14 November 1679, about the tophi of gouty patients, the influence of crystals of common salt on the human body, and the beneficial effect of drinking tea. Both letters are in <i>Collected Letters</i> , vol 3. NEHEMIAH GREW made the promise to send <i>Philosophical Transactions</i> nos. 139 and 140 in Letter L-075 of 13 October 1678, in this volume.

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<i>Letter:</i>	<b>L-099 of 2 February 1680</b>
<i>Written by:</i>	ROBERT HOOKE.
<i>Manuscript:</i>	Signed autograph. The manuscript of this English letter is to be found in London, MS. Sloane 1039, f. 172, British Museum; 1 quarto page.
<i>Summary:</i>	In this letter, HOOKE discusses L.'s recent letters and asks L. whether he would be interested in becoming a fellow of the Royal Society.

*Remarks:* L. referenced this letter in Letter 56 L-100 of 13 February 1680, *Collected Letters*, vol. 3: "I see from your kind letter of 23 January, O.S., that you read out my last missives in a meeting of the Royal Society, that they were welcome and that you agree with me as regards the very small particles of water, which I was glad to read."

*Text:*

I have received the favour of your two last letters and having translated them into English<sup>28</sup>. I have communicated them to the Royal Society at their public meetings who were extremely pleased with the great curiosity of your delineations and descriptions and desired me to return you their hearty thanks for your so freely and fully communicating to them what discoveries you make with your microscope<sup>29</sup>. They are much surprised with that discovery which you have made of small animals in the sap which runs from trees<sup>30</sup> and would be glad to be further informed whether you have met with them in the juice of any other vegetables or the parts of them as in fruits, flowers, leaves, roots, etc.

HEYR<sup>31</sup> had seen some observations made at their meeting of the small animals in Semine Animalium, whereby the vast numbers of those little creatures were made very visible in the liquor taken from the testicle of a stone horse<sup>32</sup>. But they have not as yet examined the melt of fishes. On other occasions have hitherto hindered me from making such trials, though I determine within a little time to make some observations of that kind of which I will give you an account.

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<sup>28</sup> Letter 53 L-096 of 20 November 1679 and Letter 54 [29] L-097 of 12 January 1680, *Collected Letters*, vol. 3.

<sup>29</sup> At the 15 January 1680 O.S. meeting of the Royal Society, "Mr. HOOKE produced the translation of a long letter, which he had received from Mr. LEEWENHOECK, written in Low Dutch; together with several curious draughts of small pieces of wood observed in the microscope; as also the letter itself. A part of this translation was read, and the delineations examined, wherein were explained the several vessels and curious contexture of the parts of wood. The remaining part was referred to the next meeting." BIRCH, *The History of the Royal Society of London*, vol. IV, p. 3.

<sup>30</sup> Hooke seems to have misread L.'s observations. In only four letters prior to this one does L. discuss sap from plants: Letter 17 [11] L-024 of 26 March 1675, Letter 18 [12] L-026 of 14 August 1675, and Letter 21 [14] L-034 of 22 February 1676, *Collected Letters*, vol. 1, and Letter 54 [29] L-097 of 12 January 1680, *idem*, vol. 3. In the 14 August 1675 letter, L. mentions "little animals" imagined by others, not observed by himself. "The like motion I have noted in the Juyce, squeezed out of the upper peel of a fresh Limon, wherein those little globuls, of which that peel is composed, do move, which are loosened by the squeezing of the Juyce. This motion of the said particles in the moisture is very pretty to behold, and many Spectators would swear they were little living Animals. Observing this motion, I conceived, that the motion of the sharp particles that are in some Saps, was not less, especially being set on by the motion of the Tongue." In the 12 January 1680 letter, he says that the little animals are in the dew, not the sap. "I have examined this sap in summer at various times and in various years and have seen in it several very little animals; I could not imagine that these had come from the wood, but thought that they originated from parts of the rain or of the dew."

<sup>31</sup> Mr. HEYR is not identified.

<sup>32</sup> At the 31 July 1679 O.S. meeting of the Royal Society, "Mr. HOOKE produced and examined the testicles of a cock just killed, but could not perceive any of those small animals in its feed, that had been seen in that of a stone-horse. It was conceived that the reason was because the cock was very young, and possibly not fit for generation." BIRCH, *History*, vol. III, p. 501.

## ADDITIONAL LETTERS ...

I readily concur with you in the opinion of the exceeding smallness of the parts of water and that it will be exceeding difficult to dissect them by the microscope<sup>33</sup>, though yet me thinks there seems to be a possibility of discovering the coloured parts of liquors they are very visible in ink and several other opacous coloured liquors, when the colour is made by a kind of precipitation (as the chemists speak) when the coloured parts of the liquor are as it were thrown out by the liquor into distinct particles and limps which yet float up and down in it being still much of the same gravity, but wither microscopes will help us to distinguish the parts of water I yet doubt.

I wonder you did not receive the letter I sent with the collections<sup>34</sup>. I delivered them to a merchant here who promised me to get them safe conveyed to you. I do much wonder that your name is not in the list of the Royal Society, especially since I find Mr. OLDENBURGH received the favours of so many excellent communications from you. If I thought it could be grateful to you I would propose you at the meeting as a candidate. If you please to let me know your thoughts of it by next I shall regulate myself accordingly and give you a speedy account thereof. There will be nothing of charge to you upon that account and I doubt not of effecting it if you desire it<sup>35</sup>.

I am endeavouring to get the delineations of your former letter graven in order to have them printed of which I may give you shortly a further account.

In the meantime, I remain  
Sr. your humble servant

R. HOOKE.

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*Letter:*                    **L-101 of 7 March 1680**

*Written by:*            THOMAS GALE.

*Manuscript:*          Signed autograph letter. The manuscript is to be found in the British Museum, London, MS. Sloane 1039, f. 172; 1 quarto page. A copy is to be found in London, Royal Society, Register Book, vol. 6.

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<sup>33</sup> At the 22 January 1680 O.S. meeting of the Royal Society, "Mr. HOOKE read a letter, which he had received from Mr. LEEUWENHOECK, giving account of some further discoveries of an exceeding small sort of worms found in ginger-water; as also the reasons, why he conceived that the parts of water cannot be made visible by a microscope." *Idem*, vol. IV, p. 5. See Letter 55 L-098 of 16 January 1680, *Collected Letters*, vol. 3.

<sup>34</sup> HOOKE is referring to his 1679 publication, *Philosophical Collections*. The first number has excerpts from L.'s Letter 43 [28] L-080 of 25 April 1679. The full text is found in *Collected Letters*, vol. 3.

<sup>35</sup> HOOKE did not wait for a reply from L. At the 25 January 1679/80 O.S. meeting of the Royal Society, WILLIAM CROONE proposed L. for membership and THOMAS GALE was requested to draw up a diploma. See BIRCH, *History*, vol. IV, p. 6. CROONE (1633-1684) was an English physician and one of the original fellows of the Royal Society. In November 1677, he was one of the nine witnesses to the replication of L.'s observations by HOOKE. GALE (1635-1702) became a fellow in 1677 and in 1679 replaced NEHEMIAH GREW as one of the Royal Society's two secretaries. He sent L. official notice, in Latin, of his election as member of the Royal Society. See Letter L-101 of 7 March 1680, in this volume, and HENIGER, "Antoni van Leeuwenhoek en zijn diploma van de Royal Society".



*Published in:* J. HENIGER 1978: "Antoni van Leeuwenhoek en zijn diploma van de Royal Society", *Gewina*, 1:4, p. 157.

*Summary:* In this letter, GALE sends L. official notice of his election as member of the Royal Society. Also included is the text on the certificate of membership sent to L.

*Remarks:* The election took place on 29 January 1679/80 O.S., which was 8 February 1680 N.S. The present letter was drafted by THOMAS GALE on 12 February O.S. and finalized on 26 February O.S., which was 7 March 1680 N.S. It was sent sometime between when Royal Society president JOSEPH WILLIAMSON approved it on 4 March 1680 O.S. and when L. sent his thanks in Letter 58 L-104 to the Royal Society, Letter 59 L-105 to ROBERT HOOKE, and Letter 60 L-106 to GALE, all dated 13 May 1680 N.S. See BIRCH, *The History of the Royal Society of London*, vol. IV, pp. 11, 13, 16, 21.

*Text of the letter:*

*A letter from Doctor GALE to Mr. LEUWENHOOK  
dated 26 February 1679 s.v.*<sup>36</sup>

Viro Clarissimo D. ANTONIO LEUWENHOOK Philosopho eximio,  
THO: GALE Regiae Societ. Secretarius S. D.

Frequens admodum erat conventus, cum nuperae observationes tuae perlegerentur. Omnia omnium tulisti puncta; nec facile erat dictu, quid potissimum in Te lauderent, ingenium, industriam, modestiam, an voluntatem illam, quâ erga collegium nostrum uteris amicissimâ. Gratiae igitur Tibi imprimis amplissimae decernebantur; censuitque consensus universus Te cooptari oportere in Societatem hanc Regiam; ut Tu ordinem nostrum, et Te vicissim ordo noster cohonestare possit. Horum omnium fidem Tibi faciet Diploma Societatis publicum, quod unâ cum his ad Te do. Rogo Te, ornatissime Vir, si tamen id necesse sit, ut hic Tuus erga Philosophiam et nos egregius animus sit perpetuus.

Vale

Londini,  
E Soc. Regiâ  
Febr. XXVI s.v.  
Anno MDCLXXIX

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<sup>36</sup> *S.V.* = *Stilus Vetus*; according to the 'Old Stile', that is the Julian calendar which remained in use in England until 1752, with a new year starting on 25 March. In Holland, the Gregorian calendar, the 'New Style', was introduced in 1582, with the year starting on 1 January. In 1680 the Gregorian calendar was ten days ahead of the Julian calendar.

## ADDITIONAL LETTERS ...

### *Text of the diploma:*

Praeses Concilium et Sodales Regalis Societatis Londini pro Scientia Naturali promovendâ Omnibus et Singulis ad quos Presentes pervenerint salutem. Cum per varia in rebus Opticis ingeniosissima Experimenta Vir solertissimus ANTHONIUS LEUWENHOOKE Delphensis singulare suum studium ad promovendos nostrae Societatis conatus jamdiu ostenderit, Sciatis quod dicta Societas laudatum Virum Dominum ANTHONIUM LEUWENHOOKE die 26<sup>o</sup> Februarij Anno Domini 1679/80 in solenni consessu conspirantibus omnium suffragijs, in sodalium suorum numerum cooptavit, Inque hujusce rei Testimonium Sigillum suum huic Diplomati affigi curavit.

Datum Londini anno salutis praedicto, Regni autem CAROLI II. Augustissimi Magnae Britanniae Regis, dictae Societatis Fundatoris et Patroni Munificentissimi Tricesimo secundo.

### *English translation of the letter (by Maurits van Woercom):*

A letter from Doctor GALE to Mr. LEUWENHOEK dated 26 February 1679 O.S.

THOMAS GALE, Secretary of the Royal Society,  
Greetings to a most illustrious man,  
Mr ANTONI VAN LEEUWENHOEK,  
excellent philosopher.

It was a very well-attended meeting when your recent observations were read out. You got everyone's votes; and it was not easy to say what they praised most in you, your talent, your zeal, your modesty, or that willingness that you show towards our society in a very friendly manner. Therefore, first of all, the greatest favours were granted to you; and the entire assembly decided that you should be recruited into this Royal Society; so that you may honour our order, and our order in turn may honour you. The diploma of the Society, which I present to you together with this letter, will give you public credit for all this.

I beseech you, most splendid man, if it is necessary, that your excellent attitude towards philosophy, and us, may be perpetual.

Goodbye.

London, at the Royal Society, 26 February 1679.

### *English translation of the diploma:*

Chairman, Council and Members of the Royal Society in London for the Promotion of the Natural Science salute all and every individual that this certificate has reached.

Since the very clever Mr. ANTHONY LEEUWENHOOK from Delft has long demonstrated his exceptional talent for furthering the endeavours of our Society through several very ingenious experiments in the field of light, you should know that said Society's acclaimed Mr. ANTHONY LEEUWENHOOK on the 26<sup>th</sup> February in the year of the Lord 1679/80 was chosen to be in the number of its Members during a solemn meeting by

unanimous vote of all. And it ensures that as proof of this its Seal is affixed to this certificate.

Given at London in the aforesaid year of the Salvation, in the thirty-second year<sup>37</sup> of the reign of CHARLES II, most exalted king of Great Britain, founder and most generous patron of said Society.

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<i>Letter:</i>	<b>L-103 of 22 April 1680</b>
<i>Written by:</i>	ROBERT HOOKE.
<i>Manuscript:</i>	This letter is known only by reference in other letters.
<i>Summary:</i>	In this letter, ROBERT HOOKE writes that the members of the Royal Society were interested in L.'s latest observations and that he has been elected a fellow of the Society by unanimous vote. He adds that THOMAS GALE, now in charge of foreign correspondence, will respond to L.'s letters.
<i>Sources:</i>	Letter 59 L-105 of 13 May 1680 to ROBERT HOOKE. Letter 60 [31] L-106 of 13 May 1680 to THOMAS GALE.
<i>Remarks:</i>	There is no mention in BIRCH, <i>The History of the Royal Society of London</i> , vol. IV, of GALE's being charged with the Society's foreign correspondence.

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<i>Letter:</i>	<b>L-112 of 4 July 1681</b>
<i>Written by:</i>	ROBERT HOOKE.
<i>Manuscript:</i>	This letter is known only by reference in other letters.
<i>Summary:</i>	In this letter, ROBERT HOOKE writes that the members of the Royal Society thank L. for the observations and reasoning in his "last two missives" and will have them published. Hooke is concerned that L. has not had proper answers to his letters and promises to do better in the future.
<i>Sources:</i>	Letter 64 L-110 of 28 September 1680 to THOMAS GALE. Letter 66 [34] L-114 of 4 November 1681 to ROBERT HOOKE. Letter 67 [35] L-116 of 3 March 1682 to ROBERT HOOKE.
<i>Remarks:</i>	L.'s "last two missives" are Letter 64 L-110 of 28 September 1680 to THOMAS GALE and Letter 65 [33] L-111 of 12 November 1680 to ROBERT HOOKE, both in <i>Collected Letters</i> , vol. 3. Neither was published in

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<sup>37</sup> CHARLES II reigned from the 1660 Restoration of the monarchy, but the Royal Society is counting his reign from the execution of his father CHARLES I in 1649, omitting the Interregnum.

## ADDITIONAL LETTERS ...

*Philosophical Transactions*, but the latter was published in *Philosophical Collections*, no. 3, of 10 December 1681.

It was in his own *Philosophical Collections*, not *Philosophical Transactions* (discontinued after owner and editor HENRY OLDENBURG's death), where HOOKE published five of L.'s letters. The first, Letter 43 [28] L-080 of 25 April 1679, had already been published in *Philosophical Collections*, no. 1, of 1 November 1679, which L. apparently was not aware of when he wrote Letter 66 [34] L-114 of 4 November 1681 to ROBERT HOOKE.

The "last letter" from HOOKE is Letter L-103 of 22 April 1680. Before L. received the present letter, he responded with four letters to HOOKE, Letter 59 L-105 of 13 May 1680 thanking HOOKE for his election to the Royal Society, Letter 61 L-107 of 14 June 1680, a short cover letter, Letter 63 L-109 of 9 August 1680 inquiring about whether his two previous letters were received, and Letter 65 [33] L-111 of 12 November 1680 about, among many other things, blood, sperm in insects, and whether animals can be generated spontaneously. All four letters are in *Collected Letters*, vol. 3. In that same period of time, L. sent three letters to THOMAS GALE and one to the members of the Royal Society, for a total of eight letters without a reply. L. must have thought it odd that after he was elected a fellow of the Society, he did not get another letter from anyone at the Society until the present Letter L-112 of 4 July 1681, 15 months later.

In Sources above, Letter 66 [34] L-114 of 4 November 1681, *Collected Letters*, vol. 3, p. 349, has a mistranslation. Letter L-113 of 17 July 1681, in this volume, is DAVID GREGORY's cover letter, not "Your [HOOKE's] letter".

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<i>Letter:</i>	<b>L-113 of 17 July 1681</b>
<i>Written by:</i>	DAVID GREGORY.
<i>Manuscript:</i>	This letter is known only by reference in another letter to HOOKE.
<i>Summary:</i>	In this letter, DAVID GREGORY encloses the letter of 4 July 1681 that ROBERT HOOKE had given to him to deliver to L., along with the assurance that his recent letters would be published. He would rather visit L., but he has to leave Holland. He hopes that L. will continue his research.
<i>Source:</i>	Letter 66 [34] L-114 of 4 November 1681 to ROBERT HOOKE.
<i>Remarks:</i>	The source Letter 66 [34] L-114 of 4 November 1681, <i>Collected Letters</i> , vol. 3, p. 349, has a mistranslation. Letter L-113 of 17 July 1781, in this volume, is GREGORY's cover letter, not "Your [HOOKE's] letter". This is the only known correspondence between L. and Scottish merchant, mathematician, and inventor DAVID GREGORY (1659-1708).

When GREGORY wrote this letter, he was still a student at the University of Edinburgh. Twenty years later, he was a fellow of the Royal Society and he and L. both had articles in two numbers of *Philosophical Transactions*, vol. 24 (1704-1705), no. 289 and no. 293. GREGORY wrote on astronomy.

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<i>Letter:</i>	<b>L-115 of December 1681</b>
<i>Written by:</i>	ROBERT HOOKE.
<i>Manuscript:</i>	This letter is known only by reference in other letters to HOOKE.
<i>Summary:</i>	In this letter, ROBERT HOOKE writes that the members of the Royal Society thank L. for the observations and reasoning in his two previous letters and will have them published.
<i>Sources:</i>	Letter 67 [35] L-116 of 3 March 1682 to ROBERT HOOKE. Letter L-117 of 20 March 1682 from ROBERT HOOKE.
<i>Remarks:</i>	In Letter 67 [35] L-116, L. writes, "Having since sent to you a few observations dated November 4th 1681, and having at the same time requested you urgently to send me an answer to a certain cure of the gout, without, however, receiving a reply, I cannot but think that either your missive or mine has been lost.", <i>Collected Letters</i> , vol. 3, p. 385. All of L.'s letters to the Royal Society are accounted for, so it must be HOOKE's reply that is lost. According to BIRCH, <i>The History of the Royal Society of London</i> , vol. III, pp. 101 and 104, HOOKE read L.'s Letter 66 [34] L-114 of 4 November 1681 to the Royal Society at the meetings of 19 November and 3 December 1681 N.S., so his lost reply would have been written shortly thereafter.

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<i>Letter:</i>	<b>L-117 of 20 March 1682</b>
<i>Written by:</i>	ROBERT HOOKE.
<i>Manuscript:</i>	Signed autograph. The manuscript of this English letter is to be found in London, MS. Sloane 1039, f. 172, British Museum; 1 quarto page. A copy is in London, Royal Society, Early Letters H3.69. On the outside, it reads, "Dr. H. to Leewenh. Thanks, & ab <sup>t</sup> y <sup>c</sup> Structure of a Muscle. Ent <sup>d</sup> LB. Suppl. Bundle V. (1) NP." That copy is the one transcribed below. Another copy is in London, Royal Society, Letter Book Original supplement 4 GH.30.98, pp. 397-398, titled, "D <sup>r</sup> 's Ans <sup>r</sup> to Leeuwenhoek's Letter of Mar: with remarks on the Structure of Muscles." That copyist changed some of the spelling and punctuation from the Early Letters copy.
<i>Published in:</i>	Not published.

## ADDITIONAL LETTERS ...

*Summary:* In this letter, HOOKE transmits to L. a copy of *Philosophical Collections*, nos. 4 and 5, containing two letters by L. that HOOKE has translated. He praises L.'s discoveries about muscles, which agree with his own, and encourages L. to further his investigations.

*Remarks:* L. summarizes the contents of this letter in the beginning of Letter 68 [36] L-119 of 4 April 1682, *Collected Letters*, vol. 3, and repeats a paragraph at the end of that letter, suggesting that he either had it translated by someone or that he could read some English himself. For another such instance, see Letter L-123 of 26 February 1683 from FRANCIS ASTON to L., in this volume.

*Text:*

Worthy S<sup>r</sup>

Yo<sup>rs</sup> of this Instant March came safe to my hands as did alsoe that w<sup>ch</sup> yo<sup>u</sup> sent in Novembr<sup>r</sup>. last<sup>38</sup>. but I much wonder to understand that yo<sup>u</sup> had not Rec'd my answer to it<sup>39</sup>, when yo<sup>u</sup> wrote this last. I shall therefore now againe acquaint yo<sup>u</sup> that I translated both this and yo<sup>r</sup> former, and Communicated them to the Society at theire meeting, who were Extreemly well pleased w<sup>th</sup> yo<sup>r</sup> excellent discoveries, and Ordered me to Returne yo<sup>u</sup> theire hearty thanks, as alsoe that I should take care as soon as might be to get them Published in the collections, which I have accordingly done<sup>40</sup> and have herew<sup>th</sup>. alsoe sent them for yo<sup>r</sup> pusall: I have as near as I could followed the sense of yo<sup>r</sup> Expressions, though not verbatim.

Yo<sup>r</sup> Discoverys both in the former and this are very considerable, but I am not a litle pleased to finde by this last that yo<sup>u</sup> have discovered y<sup>e</sup> same thing in the Muscles of flesh, w<sup>ch</sup> I long since did in those of fish especially in those of Lobsters crabs Shrimps of which I gave yo<sup>u</sup> some advertism<sup>ts</sup> about 4 years since<sup>41</sup>, at w<sup>ch</sup> time alsoe I shewed them to the Royall Society at their meeting<sup>42</sup>. Namly that y<sup>e</sup> muscles of these Creatures consisted of an innumerable company of exceeding small filam<sup>ts</sup> or strings almost 100 tymes smaller then a haire of my head; each of w<sup>ch</sup>. filam<sup>ts</sup>. was of y<sup>e</sup> shape of astring of pearle or beads of glass. soe y<sup>t</sup> asmall string of such amuscle as big as ahaire seem'd like anecklace of small seed pearle, which is usually made up of agreat number of small strings of such small seed pearle<sup>43</sup>.

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<sup>38</sup> Letter 66 [34] L-114 of 4 November 1681 and Letter 67 [35] L-116 of 3 March 1682, *Collected Letters*, vol. 3.

<sup>39</sup> The answer HOOKE refers to, Letter L-115 of December 1681, in this volume, is lost.

<sup>40</sup> HOOKE means Letter 66 [34] L-114 of 4 November 1681, published in *Philosophical Collections*, no 4 of 10 January 1682 O.S. and Letter 67 [35] L-116 of 3 March 1682, published in *Philosophical Collections*, no. 5 of February 1682 O.S. Both letters are in *Collected Letters*, vol. 3. The former letter was read and discussed at the Royal Society's meetings of 2, 9, and 23 November 1681 O.S. The latter letter was read and discussed at the meetings of 1 and 8 March 1682 O.S.

<sup>41</sup> Letter L-072 of 28 April 1678 from HOOKE to L., in this volume.

<sup>42</sup> At the meeting of the Royal Society on 18 April 1678 O.S., "Mr. HOOKE shewed the microscopical figure of the fibres of a muscle." Birch, *The History of the Royal Society of London*, vol. III, p. 401.

<sup>43</sup> L. repeats this paragraph in Letter 68 [36] L-119 of 4 April 1682, *Collected Letters*, vol. 3, pp. 425, 427.

Sign<sup>r</sup>. BORELLI in a posthumous book of his of the motion of y<sup>e</sup> Muscles seems to confirme alsoe this fabricke of amusc<sup>le</sup><sup>44</sup>. and now yo<sup>r</sup> Observations have clearly prov'd it soe y<sup>t</sup> I conceive there can remaine no further doubt. But yo<sup>u</sup> have yet carry'd us further & discover'd to us y<sup>e</sup> texture even of these filam<sup>ts</sup>. & thereby shewn us alsoe y<sup>e</sup> Reason of their contraction more clearly. Go on S<sup>r</sup>. w<sup>th</sup> these yo<sup>r</sup> most excellent inquisitions. & y<sup>t</sup> yo<sup>u</sup> may be happy & successfull in making further & further discoveries into y<sup>e</sup> arcana & mysterys of y<sup>e</sup> hitherto invisible & unknowne parts of the world is the hearty wish of y<sup>e</sup> Royall Society soe also of.

Worthy S<sup>r</sup>

Yo<sup>r</sup> very affectionate and  
very humble Servant

ROB<sup>t</sup> HOOKE S.R.S.

Gresham Collegd<sup>e</sup>  
March 10<sup>th</sup> 1681/2

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<i>Letter:</i>	<b>L-118 of 26 March 1682</b>
<i>Written by:</i>	ROBERT HOOKE.
<i>Manuscript:</i>	The signed autograph of this English letter is to be found in London, Sloane MS 1039, p. 134; 1 quarto page.
<i>Summary:</i>	In this letter, HOOKE writes to L. that his observations of shellfish muscles were well received by the Royal Society and concurred with his own.
<i>Remarks:</i>	HOOKE's previous letter to L. is Letter L-117 of 20 March 1682, in this volume, to which L. did not reply before receiving the present letter. L. replied with his final two letters to HOOKE, Letter 68 [36] L-119 of 4 April 1682 and Letter 69 L-120 of 28 July 1682, both in <i>Collected Letters</i> , vol. 3, to which HOOKE did not reply before he was replaced as Royal Society secretary on 30 November 1682 by ROBERT PLOT. The duty to correspond with L. passed to the other secretary, FRANCIS ASTON because PLOT became editor of <i>Philosophical Transactions</i> for volumes 13 and 14 in 1683 and 1684. He published six letters by L. HOOKE's next and final letter to L., sixteen years later, is Letter L-345 of 9 June 1698, in this volume.

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<sup>44</sup> GIOVANNI ALFONSO BORELLI (1608–1679) was an Italian physiologist, physicist, and mathematician. *De motu animalium* (On the motion of animals) was published posthumously in two parts in Leiden in 1685 by DANIEL GAESBEECK, JOHANNES DE VIVIE, CORNELIS BOUTESTEYN, and PIETER VAN DER AA. In the previous year, GAESBEECK had published six of L.'s letters in Dutch. Between 1685 and 1708, BOUTESTEYN and after 1704 his widow printed and sold two dozen first editions and reprints of L.'s letters in both Dutch and Latin.

## ADDITIONAL LETTERS ...

*Text:*

Worthy S<sup>r</sup>

I have rec'd yo<sup>r</sup> most Ingenious and Obleiging letter of this Present Month<sup>45</sup>, and Immediately translated it into English, and Read it to the Royall Societie at their first meeting<sup>46</sup>, who were exceedingly pleased therew<sup>th</sup> and desired me to Returne you theire hearty thanks and they doe earnestly desire yo<sup>u</sup> to Continue these yo<sup>r</sup> Curious Observacons, & wish yo<sup>u</sup> a continuance of good Success in yo<sup>r</sup> Discoveries, wh<sup>ch</sup> have bin hitherto very Considerable & Instructive. And as a mark of theire respects to yo<sup>u</sup> & of theire esteeme of yo<sup>r</sup> Discoveries, they desired y<sup>t</sup> they should be forthw<sup>th</sup> fitted for the press & published y<sup>t</sup> y<sup>e</sup> whole world might participate of the benefitt, the like sentiments & proceedings they had upon my excommunicating to them, yo<sup>r</sup> former letter of Novemb<sup>r</sup> last<sup>47</sup>, wh<sup>ch</sup> I signified unto yo<sup>u</sup> soone after, but wonder much yo<sup>u</sup> have not rec'd it. I have since published by theire ord<sup>r</sup> two of yo<sup>r</sup> letters in the Collecting<sup>48</sup> wh<sup>ch</sup> come out every month wh<sup>ch</sup> I have taken Care to convey to yo<sup>u</sup> as I shall doe the rest so fast as they come forth.

I have not exactly followed yo<sup>r</sup> letter word for word in the translat'on, but as neere as possibly I could I have expressed the true [ ] of yo<sup>r</sup> expressions, & the draughts are copied as neere as I could get them done. yo<sup>r</sup> Discoveries in this last I am very well pleased w<sup>th</sup> all for y<sup>t</sup> they doe very well concurr w<sup>th</sup> severall Observacons I made Divers yeares since and Showed them to the Society in the stringy parts of the muscles of Crabbs, Lobsters & prawns, of which about 4 yeares since<sup>49</sup>, I gave yo<sup>u</sup> some advertisem<sup>ts</sup> w<sup>t</sup> I then showed to y<sup>e</sup> Societie, was y<sup>t</sup> y<sup>e</sup> body of the muscles of these creatures, was made up of avery great number of exceeding small filaments or strings, almost 100 tymes smaller then ahaire of one's head, each of w<sup>ch</sup> appeared like a necklace of pearls & the bulke of y<sup>t</sup> muscle like a necklace of small seed pearle composed of many of those strings, though I was not so happy as to discover the like in the stringy parts of the muscles of flesh.

<sup>45</sup> Letter 67 [35] L-116 of 3 March 1682, *Collected Letters*, vol. 3, p. 383.

<sup>46</sup> At the meeting of 1 March 1682 O.S., "Mr. HOOKE produced a long letter from Mr. LEEWENHOOECK, containing an account of several curious observations and discoveries made with a microscope by himself. The letter being in Low Dutch was not read; but Mr. HOOKE having translated half of it read it to the Society, wherein was an account of several curious discoveries relating to the fibrils, hair or small claws of muscles." At the meeting of 8 March 1682 O.S., "Mr. HOOKE brought in the translation of Mr. LEEWENHOOECK's letter, which he read and explained some parts of it, and gave an account of what observations he had himself formerly made about the fibrils of muscles, their smallness, and form much like a chain of beads or a necklace of pearl; and he remarked, that he had several times written to Mr. LEEWENHOOECK to desire him to inquire further concerning the nature of muscles. Mr. HOOKE was desired to answer this letter of Mr. LEEWENHOOECK, and to send him the *Philosophical Collections* that had been printed, and to publish this letter in the next *Collections*." BIRCH, *The History of the Royal Society of London*, vol. IV, pp. 132, 135. The present letter from HOOKE to L. complies with the Royal Society's request.

<sup>47</sup> Letter 66 [34] L-114 of 4 November 1681, *Collected Letters*, vol. 3, p. 345.

<sup>48</sup> Letter 66 [34] L-114 of 4 November 1681 about hair, the living little animals in the excrement and urine of a horse, and gout was published in the 10 January 1682 O.S. issue of *Philosophical Collections*, no. 4, p. 93. Letter 67 [35] L-116 of 3 March 1682 about, among other things, muscle fibres, hair, and the cell nucleus in the erythrocytes of fish. was published in the February 1682 issue of *Philosophical Collections*, no. 5, p. 152.

<sup>49</sup> See HOOKE's Letter L-072 of 28 April 1678, in this volume.



Yo<sup>u</sup> have advanced yo<sup>r</sup> discoveries very much further in that yo<sup>u</sup> have not only discovered such knotts or folds, but even the parts or texture of those filaments and so have probably discovered y<sup>e</sup> very reason of such folding, & thereby of y<sup>t</sup> hitherto unknowne phenomeno' the Contractio & motion of muscles. Goe on S<sup>r</sup> w<sup>th</sup> these yo<sup>r</sup> most excellent Inquirys & that yo<sup>u</sup> may be happy & Successfull in making further & further discoveries into y<sup>r</sup> arcana & mysterys of the hitherto Invisible & unknown parts of the world is the hearty wish as of y<sup>e</sup> Royall Societie soe alsoe of worthy S<sup>r</sup> yo<sup>r</sup>

Most Humble Servant

S.R.S.<sup>50</sup>

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<i>Letter:</i>	<b>L-121 of 1683.</b>
<i>Addressed to:</i>	An unknown "Sir".
<i>Written by:</i>	ANTONI VAN LEEUWENHOEK.
<i>Manuscript:</i>	This letter fragment (mounted on another paper with a note by a later collector) was offered for sale in the years 2017-2024 by Antiquariat INLIBRIS Gilhofer Nfg. GmbH (Vienna, Austria).
<i>Published in:</i>	Not published.
<i>Summary:</i>	In this fragment, L. begins a letter to an unknown "Mijn Heer" countering some suggestions made by MELCHISÉDECH THÉVENOT.
<i>Remarks:</i>	<p>Although this fragment is not signed, the handwriting can be identified as that of L. For example, the letter 'v' is very characteristic for L, as is his use of a curved vertical line above the 'u'. But also, the way in which L. writes the 'm' is very similar as those in signed letters of the time. He also often uses the spelling 'Jk' for 'Ik' and consistently applies a capital H in words as 'Heer'.</p> <p>Further the words 'Veeltijts' and 'Verscheijde' in the fragment are spelled exactly the same in Letter 70 L-122 of 22 January 1683 to Christopher Wren; Letter 76 L-135 of 1683-09-17 to Francis Aston; Letter 79 L-144 of 28 December 1683 to Francis Aston and Letter 81 L-150 of 25 July 1684 to the Royal Society. Similar similarities can be found in neighbouring letters about the words 'Saaken' (in Letters 70 L-122, 74 L-132); 'Ontdecken' (in Letters 70 L-122, 72 L-128); 'Aengenaem' (in Letters 73 L-129, 76 L-135); 'Speculation' (in Letters 73 L-129, 75 L-134, 76 L-135, 79 L-144) and 'Alsdan' (in Letters 70 L-122 and 71 L-126).</p>

The following can be noted about the dating of the fragment:

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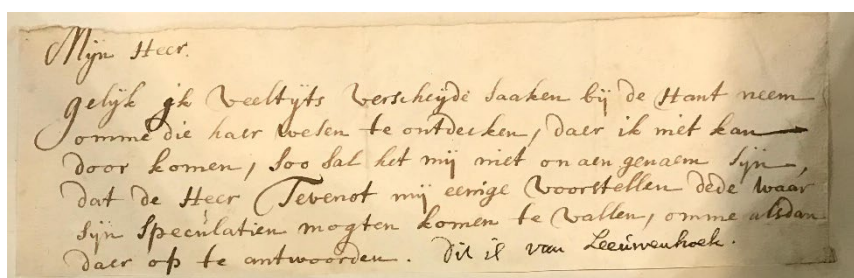
<sup>50</sup> Secretary Royal Society. On 30 November 1681, FRANCIS ASTON and HOOKE were chosen to be the secretaries for 1682. See BIRCH, *The History of the Royal Society of London*, vol. IV, p. 106. HOOKE, who was first elected secretary on 30 November 1677, served until 30 November 1682.

## ADDITIONAL LETTERS ...

The spelling of 'Tevenot' matches those in Letter 78 L-141 of 14 October 1683 to ANTONI HEINSIUS: "I have heard Mr. H. van Bleyswyk's high praise of Mons. Tevenot, and I am anxious to hear what that learned and curious gentleman will say about my statements".

L. wrote only two letters to THÉVENOT, Letter L-137 of October 1683 (only known by reference) and Letter L-201 of 1688-09-23, a cover letter for a copy of L's Letter L-200. In this letter of 1688, L's spelling is different: "Monsr Thevenot, Most learned Sir, A few years ago I took the liberty to send you a few of my modest ideas and observations, to which Your Honour replied in courteous terms". In later letters by L. the name of THÉVENOT does not occur.

*Dutch text:*



Mijn Heer

gelijk ik veeltijts verscheijde saaken bij de Hant neem omme die haer weten te ontdecken, daer ik niet kan door komen, soo sal het mij niet on aen genaem sijn, dat de Heer Tevenot mij eenige voorstellen dede waar sijn speculationen mogten komen te vallen, omme alsdan daer op te antwoorden.<sup>51</sup>

*English translation:*

Sir

As I often take various matters by the hand to discover them, because I cannot get through, so it will not displease me that Mr. Tevenot made some suggestions to me where his speculations might fall, so then to answer that ...

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<i>Letter:</i>	<b>L-123 of 26 February 1683</b>
<i>Written by:</i>	FRANCIS ASTON.
<i>Manuscript:</i>	No manuscript is known. The copy of the letter transcribed here is to be found in London, Royal Society, Letter Book Original, 8.130, 3 p. It has no salutation or signature and is titled, "Mr. ASTON to LEEUWENHOECK in

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<sup>51</sup> Written in another hand: 'dit is van Leeuwenhoek'. ['This is by L.']

Answer to his to S<sup>r</sup>. CHRIST. WREN and inviting him to go in Search of Colours.”

*Summary:* In this letter, FRANCIS ASTON accounts for L.’s recent letters and asks him to annotate or translate “terms of art” in his letters. He predicts opposition to L.’s position on the role of sperm in reproduction and invites L. to investigate colours.

*Remarks:* FRANCIS ASTON became a member of the Royal Society in 1678 and served as its second secretary from 30 November 1681 until 9 December 1685, when he resigned due to lack of compensation. See the Remarks to his final letter to L., Letter L-161 of sometime between 9 August and 22 October 1685, in this volume. It was not until the Royal Society’s elections on 30 November 1682 that ROBERT PLOT was elected secretary and editor of *Philosophical Transactions* that ASTON took over from ROBERT HOOKE as corresponding secretary. For FRANCIS ASTON, See LYONS, “Aston”.

L. refers to the present letter in two other letters, both in *Collected Letters*, vol. 4, p. 57. Letter 72 [38] L-128 of 16 July 1683 to CHRISTOPHER WREN:

Mr FRANCIS ASTON, Secretary of the Royal Society, on the 16th/26th Febr. 1682/83 wrote to tell me i.a. that my theory of animal generation through male semen is very ingenious but that I shall be contradicted by many all over the world. That is exactly what I thought, for the world is prejudiced in favour of the ovary.

Letter 76 [39] L-135 of 17 September 1683 to FRANCIS ASTON:

At the end of your letter of 16/26 Febr. 1682/83 you write: ‘for the present I cannot think of anything that is more worthy of your speculations (if you are not engaged in others) than the brilliancy of various colours, either in powders or in solid bodies, or the various hues of one and the same colour, or whether the colour is present only in one part of the wool which seems to be coloured in all its parts, etc.’

Since then, dear sir, I have given my mind to this and although I fear that I shall not carry this to a successful end, I shall, however, again apply myself to it.

See the Remarks to Letter L-130 of 27 August 1683, in this volume, for the Royal Society’s reception of this letter.

L.’s Dutch is a fair translation of ASTON’s English below; either L. had help with the translation or he was learning enough English himself. For similar instances of a direct quotation from one of ASTON’s letters, see the Remarks to Letter L-124 of 9 March 1683 from L. to ASTON and to Letter L-140 of 11 October 1683 from ASTON to L. For another such instance, see Letter L-117 of 20 March 1682 from ROBERT HOOKE to L. All three letters are in this volume.

The present letter is the first letter that ASTON wrote to L. Starting with this letter and including Letter L-160 written between 23 July and 22 October 1685, he addressed 11 letters, all in this volume, to L. Most of them were an acknowledgement of L.’s previous letter. The manuscripts

## ADDITIONAL LETTERS ...

are lost but copies are available in the Royal Society archives of the present letter and three other letters: Letter L-125 of 27 March 1683, Letter L-140 of 11 October 1683, and Letter L-146 of 7 March 1684. The other seven letters are known only by reference in letters from L.

*Text:*

Yo<sup>r</sup> letter of the 22<sup>th</sup> of January last<sup>52</sup> came safely to the hands of S<sup>r</sup>. CHRISTOPHER WREN<sup>53</sup>, who imparted it to the Society, and intends to return you his particular thanks. In the mean time I am ordered to signifie to you our Acknowledgments for the Great pains you take in prosecuting the Improvement of natural knowledg (being the one for which our Society was instituted) As also for yo<sup>r</sup> diligence in writing, without which we could not be partakers of the Industry of many worthy members of our Society living in several remote parts of the World. The observations you mention as formerly sent, have for the most part of them been printed in some of the Transactions, but because you seem not to have read them, I desire you to let me know, what you have since n<sup>o</sup>. 137 (which was the time that M<sup>r</sup>. OLDENBURG died), and I will take care to supply you with the rest the first convenience<sup>54</sup>.

Yo<sup>r</sup> Observations about wood have not been printed, but are now in a Way of being published in a month or two<sup>55</sup>. I must now desire you for my own Ease in Translating yo<sup>r</sup> language (which I understand but as a Foreigner) as also for the better comprehending yo<sup>r</sup> sense, that when ever you name a Term of Art, or thing out of Common use, you would explain it in the margin, either by a word of some other Language or a Circumlocution of yo<sup>r</sup> own. Yo<sup>r</sup> generation by an Animal in Semine Masculo is very ingenious but will find Opposers in the World till some persons have convinced themselves by Anatomy (from which all proofs must be drawn) either of its reconsileableness to Eggs, or the totall uselessness of that called an Egg<sup>56</sup>.

Y<sup>r</sup> Account of the Globules of liquours and the make of a muscle having been so particularly examined<sup>57</sup>, I cannt think of anything at present might better deserve yo<sup>r</sup> thoughts (if you are not engaged in some other Speculation) than the Appearances of severall Colours, whether in their powders, or more solid bodies, as Silk or Cloth that are coloured with one or

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<sup>52</sup> Letter 70 [37] L-122 of 22 January 1683 to CHRISTOPHER WREN, *Collected Letters*, vol. 4. L. addressed only one other letter to WREN, Letter 72 [38] L-128 16 July 1683, *ibidem*. WREN did not respond directly to either of them.

<sup>53</sup> CHRISTOPHER WREN was an architect, anatomist, astronomer, and geometer, a founder of the Royal Society, and its third president, from 1680 to 1682. He was born four days after L. and died six months before he did. In November 1677, WREN was one of the eyewitnesses to HOOKE's replication of L.'s observations of little animals. See BIRCH, *The History of the Royal Society of London*, vol. III, p. 352. For a short biography of WREN, see SUMMERSON, "Christopher Wren P. R. S. (1632–1723)".

<sup>54</sup> *Philosophical Transactions*, vol. 12, no. 137, dated 25 March 1677 O.S. HENRY OLDENBURG, the journal's founder, owner, and editor, died on 5 September 1677 O.S. For OLDENBURG, see BIRCH, *ibidem*, p. 353–356, for a short biography presented to the Royal Society on 30 November 1677 O.S.

<sup>55</sup> Letter 54 [29] L-097 of 12 January 1680 was published in *Philosophical Transactions*, vol. 13, no. 148, dated 31 December 1683.

<sup>56</sup> L. had written several times to the Royal Society about sperm since his initial Letter 35 [22] L-060, *Collected Letters*, vol. 2, in November 1677. He was becoming an advocate of the primacy of sperm. See RUESTOW, "Leeuwenhoek and the Campaign against Spontaneous Generation" and COBB, *The Egg and Sperm Race*.

<sup>57</sup> Letter 67 [35] L-116 of 3 March 1682, *Collected Letters*, vol. 3.

severall Colours. Whether the colour lye but in few places of a hair of wool that seems all coloured &c<sup>58</sup>. I name no more, as leaving the contrivance to yo<sup>r</sup> self, but rather beg yo<sup>r</sup> pardon for the liberty I take in proposing and am &c. London Feb 16<sup>th</sup> 1682/3

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*Letter:* **L-124 of 9 March 1683**

*Addressed to:* FRANCIS ASTON.

*Written by:* ANTONI VAN LEEUWENHOEK.

*Manuscript:* This letter is known only by reference in Aston's reply.

*Summary:* In this letter, L. replies to FRANCIS ASTON that he will send the Royal Society his observations about generation and colours, among other things.

*Source:* Letter L-125 of 27 March 1683 from FRANCIS ASTON

*Remarks:* This is L.'s first letter to ASTON, a response to ASTON's Letter L-123 of 26 February 1683, in this volume. It is lost. In the Royal Society's Early Letters archive, the first letter from L. to ASTON is L1.69, the manuscript of Letter 76 [39] L-135 of 17 September 1683, *Collected Letters*, vol. 4. In no prior letter does L. discuss colours in this way. Further, there is no mention in the records of the meetings of the Royal Society of anything related to L. between the 7 February 1683 O.S. reading of a translation of Letter 70 [37] L-122 of 22 January 1683 and the 11 July 1683 O.S. reading of a translation of Letter 72 [38] L-128 of 16 July 1683. See BIRCH, *The History of the Royal Society of London*, vol. IV, pp. 180, 215.

Finally, in his next letter to ASTON, Letter 76 [39] L-135 of 17 September 1683, *Collected Letters*, vol. 4, L. addresses ASTON's request without any reference to any prior letter discussing colours: "At the end of your letter of 16/26 Febr. 16 82/83 you write: 'For the present I cannot think of anything that is more worthy of your speculations (if you are not engaged in others) than the brilliancy of various colours, either in powders or in solid bodies, or the various hues of one and the same colour, or whether the colour is present only in one part of the wool which seems to be coloured in all its parts, etc.'"

"Since then, dear sir, I have given my mind to this and although I fear that I shall not carry this to a successful end, I shall, however, again apply myself to it." See the Remarks to Letter L-130 of 27 August 1683, in this volume, for the reception of this letter in London.

Again, L. offers a direct translation of ASTON's words. See the Remarks to Letter L-123 of 26 February 1683 and, for a third instance, the Remarks to Letter L-140 of 11 October 1683, both in this volume.

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<sup>58</sup> L. responded to this request to investigate colours in Letter 76 [39] L-135 to ASTON of 17 September 1683, *idem*, vol. 4. See the Remarks above.

## ADDITIONAL LETTERS ...

For the present letter, however, ASTON's text is not available for comparison to determine the accuracy of L.'s translation.

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*Letter:* **L-125 of 27 March 1683**

*Written by:* FRANCIS ASTON.

*Manuscript:* No manuscript is known. The copy of the letter transcribed here is to be found in London, Royal Society, Letter Book Original 8.144, 2 pp. It has no salutation or signature and is titled, "Mr. Aston to Mr. Leewenhoeck mentioning the receipt of his Letter & the Choice of Officers."

*Summary:* In this letter, Royal Society secretary FRANCIS ASTON writes to L., mentioning the receipt of his letter and the choice of new Royal Society officers. He promises to send future numbers of *Philosophical Transactions*.

*Remarks:* ASTON's previous letter to L. is Letter L-123 of 26 February 1683. He ends it by requesting that L. investigate "the appearances of several colours". L. did so in his reply, Letter L-124 of 9 March 1683. Both letters are in this volume.

*Text:*

I am to acknowledg the receipt of yo<sup>r</sup> last letter dated March 9<sup>th</sup>,<sup>59</sup> and am very glad of yo<sup>r</sup> Perseverance in making usefull observations about natural things, as generation colours &c which our Society will be very glad to partake of, as soon as you think fit to let them come forth of your hands. I have herewith sent you the Transactions from N<sup>o</sup>. 137 to 142<sup>60</sup>. And a Catalogue of this Society as it was printed the last November<sup>61</sup>. But the President, Councell and Secretary's being then new chosen, I must inform you that S<sup>r</sup>. JOHN HOSKINS<sup>62</sup> is

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<sup>59</sup> This letter from L. to ASTON, Letter L-124 of 9 March 1683, in this volume, is lost and is known only by this reference.

<sup>60</sup> *Philosophical Transactions*, vol. 13, no. 140 dated 31 August 1678 and no. 142 dated 28 February 1679 contain translated excerpts of L.'s Letter 35 [22] L-060 of November 1677 to WILLIAM BOUNCKER and Letter 38 [24] L-070 of 18 March 1678 and Letter 39 [25] L-073 of 31 May 1678, both to NEHEMIAH GREW, *Collected Letters*, vol. 2. All three letters were about the role of the newly discovered sperm in reproduction.

<sup>61</sup> After being bequeathed the large library of the Duke of Norfolk, the Royal Society decided to make a catalogue of the library as well as its other holdings, titled *Royal Society, Bibliotheca Norfolkiana; sive, Catalogus libb. manuscriptorum et impressorum in omni arte et lingua, quos illustriss princeps, Henricus Dux Norfolkie, &c., Regie Societati Londinensi pro Scientia naturali promovenda donavit* (Royal Society, Norfolk Library; or, Catalog libb. of manuscripts and prints in every art and language, which the illustrious prince, Henry Duke of Norfolk, &c., gave to the Royal Society of London for the promotion of Natural Science). The Society later developed a system so that books that were borrowed from the library could be accounted for.

<sup>62</sup> JOHN HOSKYN (1634-1705) was an English lawyer and baronet, a founder of the Royal Society, its fourth president from November 1682 to November 1683, and one of its secretaries from December 1685 to November 1687.

President in the place of S<sup>r</sup>. CHRIST. WREN<sup>63</sup>, and I secretary in the place of Mr. HOOK<sup>64</sup>.

The Transactions will be printed this year monthly beginning after n. 142, which I will take care to send you, when there are one or 2 more come out, in which will be some of yo<sup>r</sup> own observations<sup>65</sup>. I wish you all success in yo<sup>r</sup> Enquiries &c. Gresham College London March 17 SV 1682/3.

*Letter:* **L-127 of 7 June 1683**

*Written by:* ANTHONIE HEINSIUS.

*Manuscript:* This letter is known only by reference in other letters to HEINSIUS.

*Summary:* In this letter, ANTHONIE HEINSIUS writes that he is pleased by what he read in L.'s letter of 20 May about the series of observations concerning generation and blood circulation that he was soon to send to the Royal Society.

*Sources:* Letter 71 L-126 of 20 May 1683 to ANTHONIE HEINSIUS.  
Letter 73 L-129 of 22 July 1683 to ANTHONIE HEINSIUS.

*Remarks:* ANTHONIE HEINSIUS and L. worked together in Delft's city hall from 1670 to 1679, when city secretary HEINSIUS was appointed pensionary for Delft in the States of Holland and began his long diplomatic career.

L. began the correspondence with Letter 71 L-126 of 20 May 1683 to HEINSIUS, which is a short list of topics that he would write about in Letter 72 [38] L-128 of 16 July 1683 to CHRISTOPHER WREN, among other things, frog sperm, the circulation of the blood, and digestion. Both letters are in *Collected Letters*, vol. 4.

The present letter is HEINSIUS's first known letter to L., a reply to Letter 71 L-126. The following week, L. replied to HEINSIUS with Letter 73 L-129 of 22 July 1683, *ibidem*, with which he enclosed a copy of Letter 72 [38] L-128 to CHRISTOPHER WREN. The follow-up Letter 74 L-132 of 2 September 1683 is a note to HEINSIUS in Paris asking for HEINSIUS's opinions about the observations in Letter 72 [38] L-128.

HEINSIUS's next letter to L. is Letter L-133 of 10 September 1683, in this volume, acknowledging receipt of Letter 73 L-129, to which L. replied with Letter 75 L-134 of 16 September 1683, *ibidem*, asking whether HEINSIUS would like to see a copy of L.'s next letter to the Royal Society, about living organisms in human mouths and the structure

<sup>63</sup> For CHRISTOPHER WREN (1632-1723), see ASTON's Letter L-123 of 26 February 1683, in this volume.

<sup>64</sup> The literal reading of this passage would indicate that HOSKYNS had become both president and secretary. In fact, at the Royal Society's annual elections on 30 November 1682, ASTON was reelected as secretary and ROBERT PLOT was elected to replace HOOKE as second secretary and *Philosophical Transactions* editor. The copyist probably omitted PLOT's name. See BIRCH, *The History of the Royal Society of London*, vol. IV, p. 168.

<sup>65</sup> Under editors ROBERT PLOT (1640-1696) and WILLIAM MUSGRAVE (1655-1721), ten of L.'s letters were published in volumes 13-15 of *Philosophical Transactions*.

## ADDITIONAL LETTERS ...

of the skin. L.'s Letter 77 L-136 of 30 September 1683 to HEINSIUS, *ibidem*, is a cover letter accompanying a copy of that letter, Letter 76 [39] L-135 of 17 September 1683 to FRANCIS ASTON.

In addition to the present letter, another four letters from HEINSIUS to L. are known. Letter L-139 of 8 October 1683, Letter L-160 of 3 August 1685, and Letter L-163 of 31 August 1685 are all in this volume and L. replied promptly to each of them. HEINSIUS's final letter is thirty years later, Letter 313 L-515 of 28 February 1715, *idem*, vol. 17, thanking L. for his letters and praising his importance, to which L. replied with his final letter, Letter 321 L-526 of 25 February 1716, *ibidem*. In those years between, L. wrote an additional 20 letters to HEINSIUS, about half of them with scientific observations. The others contain notes for letters and copies of letters to others. There is no known reply from the busy HEINSIUS to any of them, suggesting some lost letters.

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<i>Letter:</i>	<b>L-130 of 27 August 1683</b>
<i>Written by:</i>	FRANCIS ASTON.
<i>Manuscript:</i>	This letter is known only by reference in other letters.
<i>Summary:</i>	In this letter, FRANCIS ASTON thanks L. for his recent letter and notes that it will be published in <i>Philosophical Transactions</i> . ASTON agrees to L.'s request to admit two Dutch noblemen to a meeting of the Royal Society.
<i>Sources:</i>	Letter 75 L-134 of 16 September 1683 to ANTHONIE HEINSIUS. Letter 76 [39] L-135 of 17 September 1683 to FRANCIS ASTON.
<i>Remarks:</i>	<p>As ASTON wrote, L.'s Letter 72 [38] L-128 of 16 July 1683 was published in <i>Philosophical Transactions</i>, vol. 13, no. 152, dated 20 October 1683 and titled, "An abstract of a letter from Mr. Anthony Leeuwenhoeck of Delft about generation by an animalcule of the male seed. Animals in the seed of a frog. Some other observables in the parts of a frog. Digestion, and the motion of the blood in a fever".</p> <p>For the letter from the two unidentified Dutch noblemen, see Letter L-131 of August or September 1683, in this volume.</p> <p>In ASTON's previous letter to L., Letter L-125 of 27 March 1683, to which L. did not reply, ASTON followed up on the Royal Society's request in the present letter.</p> <p>L. replied to the present letter with Letter 76 [39] L-135 of 17 September 1683, <i>Collected Letters</i>, vol. 4, in which he discusses, among other things, saliva from a variety of people and how he cleans his own teeth. He also describes bacteria for the first time.</p> <p>The Royal Society read and discussed that letter at the beginning of their meeting of 24 October 1683 O.S. See BIRCH, <i>The History of the Royal Society of London</i>, vol. IV, p. 219.</p>

A letter of Mr. LEEWENHOECK, dated September 17, 1683, was read, containing a description of three sorts of animals found in the scurf of the



teeth, when it is mixed or dissolved in spittle or rain-water. These animals die in the water upon putting in a drop or two of wine-vinegar.

The letter contained also an account of the substance in the nose and face called worms, which are nothing else but pieces of hair, sometimes to the number of twenty or thirty, mixed with a clammy body.

It contained likewise a discovery of the structure of the cuticula in a man to be all scaly like a fish, and the scales when to be five-sided, to lie three deep one upon another, to expose but one third part of a scale to view, to shed at some times from the body, to be so small, that a sand will cover 200 of them. It was also affirmed, that there are no visible pores for the ejection of sweat.

It was desired, that Dr. SLARE<sup>66</sup> would endeavour to borrow one of Mr. MELLIN's<sup>67</sup> glasses, whereby these observations of Mr. LEEWENHOECK might be examined at the next meeting.

Some being apt to doubt, whether bodies so small as Mr. LEEWENHOECK mentioned, are really to be seen, Dr. KING<sup>68</sup> affirmed, that he had seen things after 3000 times magnifying, which were then no bigger than the point of a fine needle.

Dr. GREW objected against there being no pores in the body, and said, that he had seen pores in the hand ranged in spherical triangles, and some in elliptics.

Dr. KING mentioned a worm, which he had found in the liver of a mouse.

Mr. ASTON was desired to inquire in his answer to Mr. LEEWENHOECK, whether the latter had observed any worms in the putrefaction of boils or the small pox.

The Royal Society published Letter 76 [39] L-135 in two parts, the first in *Philosophical Transactions*, vol. 14, no. 159, dated 20 May 1684 and titled, "An abstract of a letter from Mr. Anthony Leevenhoeck at Delft, dated Sep. 17. 1683. Containing some microscopical observations, about animals in the scurf of the teeth, the substance call'd worms in the nose, the cuticula consisting of scales". Nine years later, they published the second part in *idem*, vol. 17, no. 197, dated 28 February 1693 and titled, "An extract of a letter from Mr. Anth. Van Leuwenhoek, concerning animalcules found on the teeth; of the scaleyness of the skin, &c."

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<sup>66</sup> FREDERICK SLARE (c.1647–1727) was an English physician and chemist who was elected to the Royal Society in 1680 and frequently had articles published in *Philosophical Transactions*. In 1678, he confirmed L.'s observations of sperm in animal semen. During 1683, he was one of the Society's two curators of experiments, doing mostly chemical experiments, especially with phosphorus. For more, see HALL, "Frederick Slare".

<sup>67</sup> JOHN MELLIN (1650–1700) was a London lens grinder who specialized in lenses of a very short focal length, described by NEHEMIAH GREW in 1681 in *Musaeum Regalis Societatis, or, A catalogue & description of the natural and artificial rarities belonging to the Royal Society and preserved at Gresham Colledge*. MELLIN demonstrated his lenses at the meeting of the Royal Society on 13 May 1680. See BIRCH, *idem*, vol. III, p. 36.

<sup>68</sup> EDMUND KING (c.1630–1709) was an English surgeon and physician and member of the Royal Society after 1666. His magnification of "3000 times" is an example of the cubical augmentation used in the early days of the study of optics.

## ADDITIONAL LETTERS ...

<i>Letter:</i>	<b>L-131 of August or September 1683</b>
<i>Written by:</i>	Two Dutch noblemen.
<i>Manuscript:</i>	This letter is known only by reference in another letter.
<i>Summary:</i>	In this letter, two unnamed Dutch noblemen explain that they did not accept L.'s invitation that they meet FRANCIS ASTON and attend a meeting of the Royal Society because they feared that their lack of English would inconvenience the members.
<i>Source:</i>	Letter 76 [39] L-135 of 17 September 1683 to FRANCIS ASTON.
<i>Remarks:</i>	L. often omits the names of his visitors and correspondents, even when they are otherwise well known. These two noblemen may well be mentioned by name in other letters.

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<i>Letter:</i>	<b>L-133 of September 1683</b>
<i>Written by:</i>	ANTHONIE HEINSIUS.
<i>Manuscript:</i>	This letter is known only by reference in another letter and from a note in HEINSIUS' journal of incoming and outgoing correspondence in HEINSIUS' archive in the National Archive in The Hague, access number: 3.01.19, inv. no. 1.
<i>Summary:</i>	In this letter, ANTHONIE HEINSIUS writes from Paris that he and several of his colleagues are pleased by L.'s observations.
<i>Source:</i>	Letter 75 L-134 of 16 September 1683 to ANTHONIE HEINSIUS.
<i>Remarks:</i>	HEINSIUS refers to the observations in Letter 72 [38] L-128 of 16 July 1683 to CHRISTOPHER WREN, a copy of which L. had sent to HEINSIUS under cover of Letter 73 L-129 of 22 July 1683. Both letters are in <i>Collected Letters</i> , vol. 4. HEINSIUS wrote from Paris because after the Peace of Nijmegen in 1683, stadtholder WILLEM III of Orange-Nassau sent HEINSIUS on a mission to Versailles to negotiate the status of the principality of Orange, of which WILLEM III was sovereign prince but which was then occupied by LOUIS XIV.

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<i>Letter:</i>	<b>L-137 of October 1683</b>
<i>Addressed to:</i>	MELCHISÉDECH THÉVENOT.
<i>Written by:</i>	ANTONI VAN LEEUWENHOEK.
<i>Manuscript:</i>	This letter is known only by reference in other letters.

- Summary:* In this letter, L. sends some observations that he expects will please THÉVENOT, of whom he had heard “high praise” from Mr. HENDRIK VAN BLEYSWIJK.<sup>69</sup>
- Sources:* Letter 78 L-141 of 14 October 1683 to ANTHONIE HEINSIUS.
- Letter 111 L-201 of 23 September 1688 to MELCHISÉDECH THÉVENOT.
- Remarks:* This is the first of two known letters from L. to THÉVENOT. For THÉVENOT’s reply, see Letter L-138 of October 1683, in this volume. The other is Letter 111 L-201 of 23 September 1688, *Collected Letters*, vol. 8. See also the letter fragment that mentions him, Letter L-121 of 1683, in this volume.
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- Letter:* **L-138 of October 1683**
- Written by:* MELCHISÉDECH THÉVENOT.
- Manuscript:* This letter is known only by reference in another letter.
- Summary:* In this letter, THÉVENOT replies courteously to L.’s letter of October 1683.
- Source:* Letter 111 L-201 of 23 September 1688 to MELCHISÉDECH THÉVENOT.
- Remarks:* This letter is the only known letter to L. from French scholar MELCHISÉDECH THÉVENOT (1620-1692). L.’s two letters to THÉVENOT are Letter L-137 of October 1683, in this volume, and Letter 111 L-201 of 23 September 1688, *idem*, vol. 8. See also the letter fragment that mentions him, Letter L-121 of 1683, in this volume.
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- Letter:* **L-139 of 8 October 1683**
- Written by:* ANTHONIE HEINSIUS.
- Manuscript:* This letter is known only by reference in other letters to HEINSIUS and from a note in HEINSIUS’ journal of incoming and outgoing correspondence in HEINSIUS’ archive in the National Archive in The Hague, access number: 3.01.19, inv. no. 1.
- Summary:* In this letter, ANTHONIE HEINSIUS writes from Paris that he and several

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<sup>69</sup> HENDRIK VAN BLEYSWIJK (1628-1703) was a magistrate and mayor of Delft from 1669-1699, so he would have had repeated contact with L. in Delft’s Stadhuis (City Hall). L. addressed five letters to BLEYSWIJK between December 1695 and February 1702. In late 1697 and 1698, BLEYSWIJK and GOTTFRIED LEIBNIZ exchanged letters, in four of which they discussed L.

## ADDITIONAL LETTERS ...

of his colleagues are pleased by L.'s observations. Some of L.'s letters are being published in the new *Journal de Médecine*.

*Sources:* Letter 78 L-141 of 14 October 1683 to ANTHONIE HEINSIUS.

*Remarks:* HEINSIUS refers to *Journal de médecine ou observations des plus fameux médecins, chirurgiens et anatomistes de l'Europe, tirées des Journaux des païs étrangers, et d'autres mémoires particuliers envoyez a Monsieur l'Abbé de la Roque* (Medical journal of observations of the most famous doctors, surgeons and anatomists of Europe, from the journals of foreigners' own country, and individual memoirs sent to Monsieur l'Abbé de la Roque). This journal was founded to publish summaries and excerpts in French of foreign scholars. It managed only six monthly issues in the first half of 1683, perhaps because JEAN-PAUL DE LA ROQUE was also editing *Journal des Sçavans*. The *Journal de médecine* was revived in 1686 under the direction of JEAN BRUNET.

In the March 1683 issue, LA ROQUE published part of the Letter 32 [20] L-056 of 14 May 1677, on pp. 112-128 with no figures. This publication is not noted in the introductory information for this letter in vol. 2, p. 209, which does note the publication of part of the letter spread over three issues of the *Journal des Sçavans* in April, May, and June of 1679.

Two months later in the May 1683 issue of *Journal de Médecine*, LA ROQUE published part of Letter 67 [35] L-116 of 3 March 1682, on pp. 203-219 with 4 of 7 figures (only 6 are in *Philosophical Transactions*). For this letter, *Collected Letters* vol. 3, p. 383, has incorrect page numbers.

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*Letter:* **L-140 of 11 October 1683**

*Written by:* FRANCIS ASTON.

*Manuscript:* No manuscript is known. The copy of the letter transcribed here is to be found in London, Royal Society, Letter Book Original 9.14, 2 pp. It has no salutation or signature and is titled, "Mr. Aston to Mr. Leewenhoeck Mentioning the Receipt of his Letter &c."

*Published in:* Not published.

*Summary:* In this letter, FRANCIS ASTON writes to L. about the translation of a Dutch phrase from his letter of 16 July 1683. He discusses the cicatricula of chicken eggs.

*Remarks:* L. references the present letter in Letter 79 [40] L-144 of 28 December 1683 to ASTON, *Collected Letters*, vol. 4, p. 169: "In your welcome letter of October 1st 1683 you say among other things: 'I hope you have received the Transactions we last sent to you.' I have since anxiously looked out for them. I am at a loss, however, for neither before nor after that have I received any Transactions." Here, L. directly and accurately translates ASTON's words, as he did twice previously. See the Remarks to Letter L-123 of 26 February 1683 and to Letter L-124 of 9 March 1683, both in

this volume.

L. responded to the present letter with Letter L-143 of 26 October 1683, in this volume, about the cicatricula on the yolk of an egg. Before ASTON could reply, L. sent Letter 79 [40] L-144 of 28 December 1683, *ibidem*, about skin diseases, intestines, and the effects of vinegar. It was read at the Royal Society's meeting of 13 February 1683/4 O.S. See BIRCH, *The History of the Royal Society of London*, vol. IV, p. 254:

An extract of a letter for Mr. LEEWENHOECK, dated at Delft December 28, 1683 was read, containing some farther observations of the scales growing upon men as they do on fishes: of the scales on the middle of the lips: of a scaly child: also an examination of the slimy matter or woolly substance within the guts: and an experiment, that water passes through a bladder, when wine will not. This experiment was not looked upon as new, though the truth of it was not doubted of.

Letter 79 [40] L-144 was published in *Philosophical Transactions*, vol. 14, no. 160, dated 20 June 1684 and titled, "An abstract of a letter from Mr. Leewenhoek of Delft, dated Decemb. 28th, 1683. concerning scales within the mouth, the scaly child that was shewn, the anatomy of the slime within the guts, and the use thereof".

*Text:*

I have received yo<sup>r</sup> letter of the 17th of September<sup>70</sup>, which I will not faile to communicate to the Society as soon as they meet (after their usual Vacation) which I think will be in a weeks time<sup>71</sup>.

I forgot to ask you in my last letter<sup>72</sup> whether by the words Het plaetie of Stipie van het doyr<sup>73</sup>, you did not mean the Cicatricula w<sup>ch</sup> is a speck like an Eye sticking to the Outside of the coat of the yoalk, this is the principall part where out the Chicken has its first Original. But (you know) the Chicken is first nourisht by the white of the Eeg, and afterwards when that is consumed by the yoalk. In this Cicatricula, which is in all Eggs, MALPIGHIIUS has found the Lineaments of the Chicken<sup>74</sup>. And I suppose this is the part where the Animal of the Male Seed may be received.

I hope the last Transactions I sent are come to yo<sup>r</sup> hands<sup>75</sup>, when three or 4 more are publisht I will send them according to yo<sup>r</sup> directions. I wish you good Success in all yo<sup>r</sup>

<sup>70</sup> In Letter 76 [39] L-135 of 17 September 1683, *Collected Letters*, vol. 4, among other things, L. describes bacteria for the first time. He found it in his own dental plaque.

<sup>71</sup> See Remarks above.

<sup>72</sup> Letter L-130 of 27 August 1683, in this volume.

<sup>73</sup> Letter 72 [38] L-128 of 16 July 1683, *Collected Letters*, vol. 4, p. 58, n. 9. ASTON is correct about L.'s meaning. Four years later, the Royal Society was still concerned about the cicatricula. At the meeting of 27 April 1687 O.S., "It was ordered, that it be inquired of Mr. LEEWENHOECK, whether he could discover any animalcule in the cicatricula of an egg; and that he be desired to inform the Society about what time of the year he made his observations, of the liquor of oysters being full of animals." BIRCH, *The History of the Royal Society of London*, vol. IV, p. 534.

<sup>74</sup> MALPIGHI's *De Formatione Pulli in Ovo* [The formation of chickens in eggs] was published by JOHN MARTYN for the Royal Society in 1673.

<sup>75</sup> See Letter L-125 of 27 March 1683 from ASTON to L., in this volume.

## ADDITIONAL LETTERS ...

undertakings, and shall be very glad to serve you in what lyes in my power as &c. London October 1<sup>st</sup> 1683. S.V.<sup>76</sup>

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<i>Letter:</i>	<b>L-142 of October 1683</b>
<i>Written by:</i>	ANTHONIE HEINSIUS.
<i>Manuscript:</i>	This letter is known only by a note in HEINSIUS' journal of incoming and outgoing correspondence in HEINSIUS' archive in the National Archive in The Hague, access number: 3.01.19, inv. no. 1.
<i>Summary:</i>	In this letter from Paris, ANTHONIE HEINSIUS responds to a letter from L.
<i>Source:</i>	National archive, The Hague.

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<i>Letter:</i>	<b>L-143 of 26 October 1683</b>
<i>Addressed to:</i>	FRANCIS ASTON.
<i>Written by:</i>	ANTONI VAN LEEUWENHOEK.
<i>Manuscript:</i>	No manuscript is known. A copy of the translation of L.'s reply to ASTON's Letter L-140 of 11 October 1683, in this volume, is to be found in London, Royal Society, Letter Book Original 9.17, p. 31. It has no salutation or signature and is titled, "Mr. LEEUWENHOECK to Mr ASTON being the Translation of his letter dated the 26th of October 1683, about the speck or point of the yolk of the egg vir <sup>t</sup> Cicatricula."
<i>Summary:</i>	In this letter, L. replies to ASTON's recent letter of about the cicatricula on the yolk of an egg.
<i>Remarks:</i>	For the present letter, there is no record in BIRCH, <i>The History of the Royal Society of London</i> , vol. IV, of the reception, translation, or reading of it at a meeting of the Royal Society. ASTON did not mention it in any of his letters to L., and it was not published in <i>Philosophical Transactions</i> .
<i>Text:</i>	

I received yo<sup>rs</sup> of the first Instant<sup>77</sup>, whereby I understand that the Royal Society is not yet mett since their last adjournment; when you have communicated my last Observations, I desire you to let me know whether they were well accepted<sup>78</sup>.

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<sup>76</sup> S.V. = *Stilus Vetus*, Latin for Old Style.

<sup>77</sup> See ASTON's Letter L-140 of 11 October 1683, in this volume.

<sup>78</sup> At the beginning of the Royal Society's meeting of 24 October 1683 O.S., L.'s Letter 96 [39] L-135 of 17 September was read and discussed in detail. See Letter L-140 of 11 October 1683, in

By the Speck or point of the yoalk of the Egg, I mean the Cicatrix<sup>79</sup>, or mark which the yoalk has, wherein MALPIGHIIUS found the first Rudiments of the Chicken<sup>80</sup>. For as often as I sought the male seed in the yoalk of the Egg, I sought it only in the Cicatrix, whether the Eggs were now laid, or had been sat upon a day or two. The parts whereof the Cicatrix consists, appeared to me so confuted, and large, that I made no Representation of them. I know well that the Chicken is first fed out of the white, for if an Egg be broken a day or two before the Chicken is hatched, we find the yoalk almost entire, which serves for nourishment afterwards. I have not viewed the Transactions you say you sent me last<sup>81</sup>, And shall expect them thankfully as being very much obliged to you. I have some other Observations written, which I would not burthen you with at present, desiring you to present my Service to the Royal Society.

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<i>Letter:</i>	<b>L-145 of October 1683</b>
<i>Written by:</i>	DANIEL VAN GAESBEECK.
<i>Manuscript:</i>	No manuscript is known.
<i>Published in:</i>	A. LEEUWENHOEK 1684: <i>Ondervindingen en Beschouwingen der onsigtbare geschapene waarheden, vervat in verscheydene Brieven, geschreven aan de Wijt-beroemde Koninklijke Societeit in Engeland</i> , (Leyden, Van Gaesbeeck).
<i>Summary:</i>	VAN GAESBEECK dedicates to L. a volume of several letters written by L. to members of the Royal Society. Addressing L., he justifies printing the letters without L.'s permission and notes the help of CORNELIUS VAN 'S GRAVESANDE and the plate engraver ABRAHAM DE BLOIS. He ends with a plea that L. will continue to publish his letters in Dutch so that they can be read by his countrymen.
<i>Remarks:</i>	This open letter was the dedication to the first volume of L.'s letters, printed in Leiden by DANIEL VAN GAESBEECK without L.'s permission. VAN GAESBEECK (born 1634) was a well-established publisher in Leiden. Until he took it upon himself to print six of L.'s letters in Dutch, L.'s only publications were the letters translated, excerpted, and published in English in <i>Philosophical Transactions</i> and a few subsequent retranslations into French and Latin.  Van GAESBEECK published three letters that L. had written in the early 1680s but that had never been published in <i>Philosophical Transactions</i> . They were separately paginated, so the surviving bundles contain two or three of these letters: Letter 62 [32] L-108 of 14 June 1680 to THOMAS GALE and Letter 65 [33] L-111 of 12 November 1680 to ROBERT HOOKE,

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this volume, for the account of the meeting in BIRCH, *The History of the Royal Society of London*, vol. IV, p. 219.

<sup>79</sup> Cicatrix, the germinating or formative point in the yolk of an egg.

<sup>80</sup> MALPIGHI's *De Formatione Pulli in Ovo* [The formation of chickens in eggs] was published by JOHN MARTYN for the Royal Society in 1673.

<sup>81</sup> For these numbers of *Philosophical Transactions*, see Letter L-125 of 27 March 1683 from ASTON to L., in this volume.

## ADDITIONAL LETTERS ...

*Collected Letters*, vol. 3, and Letter 76 [39] L-135 of 17 September 1683 to FRANCIS ASTON, *idem*, vol. 4.

In that same year, 1684, VAN GAESBEECK published, under three different titles, three other letters by L., Letter 70 [37] L-122 of 22 January 1683 to CHRISTOPHER WREN, Letter 79 [40] L-144 of 28 December 1683, and Letter 80 [41] L-147 of 14 April 1684, both to FRANCIS ASTON. All three letters are in *ibidem*. The following year, L. began working with the more established publisher CORNELIS BOUTESTEYN, whose printing house was only a few doors from VAN GAESBEECK's along the east side of Leiden's Rapenburg canal.

See Letter L-149 of 24 July 1684 from VAN GAESBEECK to his readers, in this volume, for his summaries of the six letters.

*Dutch text:*

ANTONI VAN LEEUWENHOEK

Naaukeurig, gelukkig en konstig uitvinder der ingeschapene verborgene waarheden, en waardig mede-broeder des hoogloflijke Koninklijke weetenschaps-soekende Societeits In England

Sy alle heil en zeegen.

Myn Heer,

Als de werelt seer verwonderd sprak, van de uitvindinge tot beschouwinge der onsenelijcke verborgenheids waarheden, door UE. opgelost, ende dat veele boeken in andere landen en talen daar af gewaagden, brande mijn lust, om meede een oog-getuige daar in te zijn; soo heeft den geleerden medicijnenmeester de Heer CORNELIUS VAN 'S GRAVESANDE, Raad en Scheepen der stad Delft, bij UE. geleid: Waar ik door UE. konstige en niet min loflijke uitvindinge, die verwonderlijke verborgenheden Gods, door UE. beleefde goeddadigheid komende te beschouwen, soo bevond ik, dat vreemde boeken die daer af door de wereld sweeven, in den sin, afteekening en waardigheid niet weinig verschilden, en ook dat onse eige ingeboorne landsaten in haar taal niet konden genieten die wetenschappen, die reeds eenige naburige volkeren in haar eijgen taal en sprake waren bekend geworden.

Derhalve niet rustende, ofte ik had bekoomen yets van 't gene UE. selfs de weerelt meede gedeelt had, so wierden mij ter hand gesteld (door een Heer, die ik en de wereld daar voor moet danken) deese UE. nevensgaande brieven, bij UE. gesonden aan UE. meede Broeders van dat Hoogloflijke Collegie des Koninklijke Societeits in England. Deese (waarin soo bijzondere wonderheden waren aan te schouwen) dagten mij te waardig om niet aan alle onse Landgenooten in haar eigen taal (door hulp van den voornoemden Heer, en myn druk-pers, mitsgaders de konstige hand des plaat-snyders, ABRAHAM DE BLOIS te Delft) sigtbaar voor te stellen, als zijnde een grondsteen waar op alle wijsgerige en doordringende verstanden voortbouwen en haare wetenschappen verder verklaren.

Soo leg ik deese mijne daad en sorge wederom voor UE. neder; en hoope, dat dit mijn stout bestaan bij UE. over 't hoofd gesien ende ten besten geduid sal werden; dat ook UE. deze uwe eerstelingen (die dan een Engels, dan een Frans, en dan wederom een Oud-Rooms hulsel sijn opgeset en daar door veel van haar eijgen wesen en luijster hebben verloren, en nu eerst het licht in haar eijgen vaderland komen te aanschouwen) niet en sult afwijzen; maar als UE. eijgene vrugten en maaksels uwes verstands erkennen en aanhooren;



ende daar door nog meer en meer bewogen, maar ook die gene, die UE. (soo ik onderrigt ben) omtrent thien jaaren herwaards aan het Hoogloflijk Collegie in Engeland hebt opgedist, tot voldoeninge van onse ingesetene wijsgeerders meede te deelen, en dien kostelijken schat onse ingeboorne niet langer te onthouden, waartoe ik hoope God de Heere UE. onderzoekingen meerder en altoos sal zeegenen.

Blyvende UE verpligten Dienaar,

DANIEL VAN GAAESBEECK.

Uit mijn Drukkery  
Den 1 Januari, 1684

*English translation by Douglas Anderson:*

ANTONI VAN LEEUWENHOEK  
Exact, happy and skillful discoverer of innate hidden truths,  
And worthy fellow-brother of the glorious Royal knowledge-seeking Society in  
England

All health and blessings.

Sir,

Now that the world spoke in astonishment of the invention made by you for the contemplation of the invisible and hidden truths, and that many books in other countries and languages mentioned them, my desire burned to be an eyewitness therein; so the learned physician Mr. CORNELIUS VAN 'S GRAVESANDE<sup>82</sup>, council member and magistrate of the city of Delft, was guided by you. Where, through your ingenious and not least praiseworthy inventions, I contemplate those wonderful mysteries of God coming through your civil generosity, so I found that foreign books that fluttered through the world differed not a little in their sense, drawings and worthiness, and that inhabitants of our own native land could not enjoy in their language that knowledge that already had become known to some neighboring peoples in their own language and speech.

Therefore, not resting until I had obtained something of that which you had shared with the world, so were handed over to me (by a gentleman<sup>83</sup>, whom I and the world must thank for it) these your accompanying letters, sent by you to your fellow brothers of that very laudable college of the Royal Society in England. These (in which so special wonders could be seen) I thought were too worthy not to tell to all of our countrymen in their own language (by the help of the aforementioned gentleman, and my printer-press, as well as the skilled hand of plate-cutter ABRAHAM DE BLOIS<sup>84</sup> in Delft), as a foundation stone which all philosophical

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<sup>82</sup> CORNELIUS ISAACZ VAN 'S GRAVESANDE (1631-1691), a physician and city magistrate, was L.'s mentor and friend during the early part of his career. See HOUTZAGER, "Cornelis Isaacsz. 's Gravesande".

<sup>83</sup> Unnamed, but he may well have been 's GRAVESANDE.

<sup>84</sup> ABRAHAM DE BLOIS (1655-1717) was a mezzotint engraver who lived in Delft until 1686, when he moved to Amsterdam and took up copperplate engraving. He made a line engraving after the JAN VERKOLJE mezzotint engraving based on the oil portrait that VERKOLJE made of L. in 1685. L. used DE BLOIS's engraving as a frontispiece for *Vervolg der Brieven* (1687), *Arcana*

## ADDITIONAL LETTERS ...

and penetrating intellects can build on and further explain the sciences.

So I lay before you again this my deed and concerns, and hope that this my bold undertaking will be overlooked by you and be understood in the best way and that you do not refuse these your first fruits (which have been put into an English, then a French, and then again an Old Roman husk and have lost through that much of their own essence and splendor, and now for the first time come to light in their own homeland), but that you acknowledge and listen to your own fruits and the workings of your understanding and by that be moved more and more to share to the satisfaction of our resident philosophers that which you (so I have been informed) have served for ten years to the very laudable college in England, and no more withhold that precious treasure from our natives, for which purpose, I hope, God the Lord will further and always bless your inquiries.

Remaining your obliging servant

DANIEL VAN GAESBEECK<sup>85</sup>.

From my printing house  
On 1 January 1684

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<i>Letter:</i>	<b>L-146 of 7 March 1684</b>
<i>Written by:</i>	FRANCIS ASTON.
<i>Manuscript:</i>	No manuscript is known. The copy of the letter transcribed here is to be found in London, Royal Society, Letter Book Original 9.46, 2 pp. It has no salutation or signature and is titled, “M <sup>r</sup> . ASTON to M <sup>r</sup> . Leeuwenhoek mentioning the Rec <sup>t</sup> of his 28 Dec. last & encouraging him to make Experiments &c.”
<i>Published in:</i>	Not published.
<i>Summary:</i>	In this letter, FRANCIS ASTON mentions the receipt of L.’s letter of 28 December 1683, promises to send volume 13 of <i>Philosophical Transactions</i> , and encourages him to make experiments.
<i>Remarks:</i>	L. refers to the present letter in Letter 80 [41] L-147 of 14 April 1684, <i>Collected Letters</i> , vol. 4, p. 211: “Your courteous and welcome letter of 26 February duly came to hand. I saw from it that you intend to send me the <i>Transactions</i> when they have been printed in December. I am looking

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*Naturae Detecta* (1695), and the first volume of the *Opera Omnia* (1722). All three have “J. Verkolje” on the bottom left and “A. de Blois” on the bottom right. These were the prints that L. sent to London at the request of Royal Society clerk EDMOND HALLEY in Letter L-176 of 25 May 1686, in this volume. See L.’s response, Letter 93 [51] L-177 of 10 June 1686, *Collected Letters*, vol. 6. For more on L.’s series of 165 letters, in Dutch and Latin translation, published in two dozen first editions, see ANDERSON, Lens on Leeuwenhoek, <https://lensonleeuwenhoek.net/resources/publications>.

<sup>85</sup> This is VAN GAESBEECK’s only letter to L. His Letter L-149 of 24 July 1684, in this volume, is addressed “to the reader”.

forward to them and am much obliged to you for this.”

Letter 80 [41] L-147 is L.’s next and last known letter to ASTON. L. writes about the lens of the eye, then called the crystalline humour, eyelids, and the optic nerve in humans and other animals, as well as about the skin of Moors.

The first part was read at the meeting of the Royal Society on 14 May 1684 O.S.:

Part of a letter of Mr. LEEWENHOECK, dated April 14, 1684, was read; and the other part reserved till the next meeting. It was concerning the structure of the crystalline humour of the eye, which he described as consisting of many scales lying upon one another, and the scales as made of threads lying by one another in a very curious manner, as appeared from the figures.

The second part was read on 4 June 1684 O.S.:

There was read the latter part of Mr. LEEWENHOECK’s letter of April 14, 1684, concerning the crystalline humour of the eyes of birds and fishes; the vitreous humour; the cornea tunica; and the colour of a blackamore.

As to the moistness of the cornea, Dr. GREW said, that it proceeded only from the glandules in the eye; and that no part of it transudated through the cornea, as Mr. LEEWENHOECK thought might be probable, upon observing the eye parched with the fire.

With regard to the colour of blackamores, Dr. LISTER remarked, that it had been affirmed to be from a blackness in the blood, which he desired might be carefully inquired into, there being so much opportunity of doing it.

He said, that there was an ape in the Indies whose blood died a purple colour.

See BIRCH, *The History of the Royal Society of London*, vol. IV, pp. 297, 300. Letter 80 [41] L-147 was published in *Philosophical Transactions*, vol. 14, no. 165, dated 20 November 1684 and titled, “A letter from Mr. Anthony Leewenhoeck Fellow of the Royal Society, dat. Apr. 14. 1684. containing observations about the cristallin humor of the eye, &c”.

*Text:*

I have received yo<sup>rs</sup> of the 28th of December last<sup>86</sup>, but was long hindred from Answering by the Frost, which gave an unusuall interruption to Commerce. I am sorry to hear you mist of those Books<sup>87</sup>, which I have enquired of, and find that they were sent with the usuall direction to Rotterdam<sup>88</sup>. But you shall not be a looser, for as soon as the

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<sup>86</sup> Letter 79 [40] L-144 of 28 December 1683, *Collected Letters*, vol. 4. It was published in *Philosophical Transactions*, vol. 14, no. 160.

<sup>87</sup> L.’s letter to ASTON of 28 December begins, “In your welcome letter of October 1st 1683 you say among other things: I hope you have received the *Transactions* we last sent to you. I have since anxiously looked out for them. I am at a loss, however, for neither before nor after that have I received any *Transactions*.”, *Collected Letters*, vol. 4, p. 169. In no later letter does L. note that he has received them.

<sup>88</sup> At the end of Letter 76 [39] L-135 to ASTON of 17 September 1683, *ibidem*, p. 155, L. writes, “I am looking forward to the *Transactions* mentioned in your last letter; please send them to

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Transaction for December is printed, which I hope will be in a fortnight, Ile send you to compleat the whole year<sup>89</sup>.

Mr. BOYLE<sup>90</sup> hath lately printed a Book called Memoirs for a Naturall History of Human blood<sup>91</sup>. I will not fail to make yo<sup>r</sup> Compliments to him, for I have lately not been well. I shall be glad to hear from you, whenever you are at leasure. For I doubt not but the World hereafter will make very good use of the Stock and Treasure of Observations made with yo<sup>r</sup> Microscope, variety of Experiments and discoveries, being extreemly necessary to Philosophy, but Hypotheses and conclusions very uncertain, till such time as nature is fully discovered. And therefore our Society prefers 4 lines of matter of fact, written by yo<sup>r</sup> self, or others, before a Volume of notions, which are only the work of the Brain.

Gresham College London February 26<sup>th</sup> 1683/4.

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<i>Letter:</i>	<b>L-148 of 7 June 1684</b>
<i>Written by:</i>	FRANCIS ASTON.
<i>Manuscript:</i>	This letter is known only by reference in another letter.
<i>Summary:</i>	In this letter, FRANCIS ASTON writes to L. to thank him for his letter with observations of the lens of the eye, which was read to the Royal Society and was well-received by them.
<i>Source:</i>	Letter 81 [42] L-150 of 25 July 1684 to the Royal Society.
<i>Remarks:</i>	In the source letter Letter 81 [42] L-150, L. discusses the brains of various animals, blood vessels in the human eye, moxa, and skin. Over four months after it was written, on 3 December 1684 O.S., this letter was noted during a regular weekly meeting of the Royal Society. See BIRCH, <i>The History of the Royal Society of London</i> , vol. IV, p. 340, 355: "Part of a

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Rotterdam, bearing this direction: To Mrs. CATHARINA LEEUWENHOEK, Hoogh-straat int Oude Gemenelants huis At Rotterdam."

<sup>89</sup> Three letters from L. were published in volume 13 of *Philosophical Transactions*: Letter 54 [29] L-097 of 12 January 1680 to ROBERT HOOKE, *Collected Letters*, vol. 3, appeared in *Philosophical Transactions*, no. 148, dated 10 June 1683 and titled, "An abstract of a letter from Mr. Anthony Leewenhoeck of Delft to Mr. R. H. concerning the appearances of several woods, and their vessels." Letter 70 [37] L-122 of 22 January 1683 to CHRISTOPHER WREN, *Collected Letters*, vol. 4, appeared in no. 145, dated 10 March 1683 and titled, "An abstract of a letter from Mr. Anthony Leewenhoeck writ to Sir C. W." Letter 72 [38] L-128 of 16 July 1683, also, to WREN, *ibidem*, appeared in no. 152, dated 20 October 1683 and titled, "An abstract of a letter from Mr. Anthony Leeuwenhoeck of Delft about generation by an animalcule of the male seed. Animals in the seed of a frog. Some other observables in the parts of a frog. Digestion, and the motion of the blood in a feavor." The "transaction for December" is no. 154, dated 20 December 1683, which still had not been printed by the following February when ASTON wrote the present letter to L.

<sup>90</sup> For an overview of L.'s correspondence with ROBERT BOYLE (1627-1691), see the Remarks to Letter L-049 of 1677, in this volume.

<sup>91</sup> The first and only contemporary edition was published in early 1684 in London by SAMUEL SMITH.

letter of Mr. LEEUWENHOECK, dated at Delft, July 25, 1684, was read, concerning the parts of the brain of several animals, the chalk stones of the gout, the leprosy, and the scales of eels. The latter part of this letter was reserved for the next meeting.”

The holidays intervened and it was not until 7 January 1684/5 O.S. that the Royal Society had time for the rest of the letter:

The latter part of Mr. LEEUWENHOECK’s letter of July 25, 1684, was read, being observations on the brain of an ox and sparrow; on moxa, and that cotton is the fittest succedaneum for it; on the chalk bred in men, who have long had the gout: on the leprosy, as far as people are said to have it in Holland: on eels, in which he discovered both scales and fins.

Even though L. did not address his letters to ASTON, as he had done previously, ASTON continued to reply to each letter during the rest of his term as secretary. His next letter to L. is Letter L-151, written between August and mid-October 1684, in which he informs L. that his most recent letter has not been read yet because the Royal Society is not in session. ASTON wrote four more letters to L. before his term as secretary ended in December 1685. All five letters are in this volume.

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<i>Letter:</i>	<b>L-149 of 24 July 1684</b>
<i>Addressed to:</i>	the Reader.
<i>Written by:</i>	DANIEL VAN GAESBEECK.
<i>Manuscript:</i>	No manuscript is known.
<i>Published in:</i>	A. LEEUWENHOEK 1684: <i>Ondervindingen en beschouwingen der onsigbare geschapene waarheden, waar in gehandelt wert vande schobbens inde mond, de lasarie, de jeuking, 't kind met vis-schobbens, 't binnenste der darmen, en de beweging derselve, als mede het vet dat inde selve gevonden wert: Geschreven aande nyt-beroemde Koninkhyke Societeit in Engeland</i> (Leyden, Van Gaesbeeck).
<i>Summary:</i>	In this open letter from the publisher to the reader, but clearly directed toward L., VAN GAESBEECK explains why he is publishing some of L.’s letters. Comparison of L.’s manuscripts with the extracts translated into English for <i>Philosophical Transactions</i> and <i>Philosophical Collections</i> , summarized in French for <i>Journal des Sçavans</i> , and translated into French and Latin for other publications, shows how much of L.’s writing was “mutilated”, “mistranslated”, and “misunderstood”. Through the efforts of some unnamed gentlemen, VAN GAESBEECK was able to obtain some letters to publish in Dutch, apparently with L.’s permission. VAN GAESBEECK continues by summarizing the six letters that he printed that year under four separate titles.
<i>Remarks:</i>	For Leiden publisher and bookseller DANIEL VAN GAESBEECK, and the six letters that he published in 1684, see the Remarks to Letter L-145 of

## ADDITIONAL LETTERS ...

1 January 1684, in this volume.

*Dutch text:*

Den Drukker aan den Leser

Weet-gierige Leser

De Spreuk *'t minste werd gesien, 't meeste blyft verhoolen*, myn yver sugt met wonderlijke begeerte aangedaan hebbende om te beschouwen de onsigbare geschapene waarheden der wesentlijke stoffe, die door 't vergrootglasig werktuig (eerst door den vernuften Heer ANT. LEEUWENHOEK tot sodanigen volmaaktheyd, tot roem der stad Delft uitgevonden) aan de wereld wierde vertoont: waar door de Koninklijke wetenschap-soekende Societeit tot Londen sig verplicht heeft gevonden om syn Ed. als een waardig mede-broeder in haar Societeit met blijdschap aan te nemen en te omhelsen, en d' uitvindingen in haar Philosophical trans-actions de wereld (dog verminkt) op te dissen. Waar door 't puik der geleerde 't samen komste tot Leipsig is aangeset geworden om die ontdekking van syn Ed. te versoecken, ende eenige der selve in de Ephimeridis Eruditorum, (dikwils qualijk overgeset) uitgaven: Vele Franse en Latijnse scrifte melde wel van dees ontdekkinge, maar hadden den sin en meining van den voornoemden Heer qualig begrepen: so dat vele voorname en geleerde Heren syn Ed. seer aanpersten, om eenige synder bekend making in syn eigen taal ons vaderland mede te delen. So wierde myn door een voornaam Heer van ter syde, eenige tot voldoening myns yvers medegedeelt, die ik door myn druk-pers de wereld gemeen maakten en aan den Ed. uitvinder, A. van LEEUWENH. weder op droeg. Waar in syn E. voorstelde.

*De gestalten en werking van de Gist, Bloed, kreeft oog, 't voort komen van diertjens buiten de lugt, geschreven aan de Heer T. GALE, Sec. van de Con. Societeit. den 14. Feb. 1680.*

*Als mede de gestalten werking van de nyn-moer, nyn, stomme nyn, en bloed syrope, en water, van de Venae Lactae, ofte melk-vaten, en de Chylus ofte melk, vande pis en voorsegging uit de selfde, van de mist in de lugt, de brandende kaars, van 't herts gedaante en werking, van levende diere in 't manlyk saad der Kevers, Juffertjens, Sprinkhanen, Vloeyen, muggen, vande vloey beet, van de diertjens daarder 1000000000. de grote van een sand bestaan, geshreven aan de Heer R. HOOKE, Sec. van de Con. Soc. den 12, Novemb. 1680.*

*Daar en boven nog een handelende van de levende diertjens tusschen onse kies en tanden, vande aaltjens in de asyn, puisjens in 't aansig, van de schobbens en haar gedaanten op onse huyd, en de sweet-gaten inde selfde, geshreven aan de Heer F. ASTON. Sec. vande Con. Soc. den 11. Septemb. 1683.*

So is syn Ed. eindelyk door 't aansoeken van veel geleerde en wijtberoemde Heren bewogen, myn eeniger synder bekendmakinge te behandigen, om deselfde door myn druk-pers de wereld optedissen, so heeft syn Ed. myn nog boven dees begiftigt met een verhaal geschreven aan de Heer F. ASTON. Secretaris der Koninklijke Societeit tot Londen.

*Handelende over het maaksel van 't Humor Christallinas, so van verfcheyde dieren, vogelen, ende visschen, het draat-agtig wesen dat in 't oog voor komt, de vogtigheyd op het Hoorn-vlies, het maaksel van een klein bloed aderken, ende de opperste huyd van een swarte Morinne.*

En myn nog de gonstig toesegging tot voldoening der wetenschap soekende Heren, *D'ont-leding, opnassing en sterving van verscheyden Houten.*

Hopende door de verder voorspraak van verscheide Eerwaarde Heren de gonst van syn Ed. sal bekomen, om tot genoegen en voldoening der wetenschap-soekende liefhebbers meer van syn Ed. te verwerven, gebruikt dan dees onderwijl tot V. E. voordeel. en

Vaart wel.

Uyt myn Drukkerij  
den 24. Julii 1684.

DANIEL VAN GAESBEEK.

*English translation by Douglas Anderson:*

From the publisher to the reader

Curious reader

The saying, *The least is seen, the most remains concealed*<sup>92</sup>, overwhelmed my zeal with a wondrous desire to contemplate the invisible created truths of essential matter, which was demonstrated to the world through the magnifying instrument (first invented by the ingenious gentleman ANT. LEEUWENHOEK to such perfection, to the glory of the city of Delft): whereby the Royal knowledge-seeking Society in London has found itself obliged to accept and embrace his Honour with joy as a worthy confrère in the Society, and to dispense the inventions to the world in their *Philosophical Transactions* (though mutilated<sup>93</sup>). Whereby the excellence of the learned coming together in Leipzig has been encouraged to request the discoveries of his Honour and to publish some of the same in the *Ephimeridis Eruditorum*<sup>94</sup> (often mistranslated): Many French and Latin writings<sup>95</sup> reported the discoveries, but

<sup>92</sup> This saying is found in several other contemporaneous publications. DE BRUNE, “Aan de Lezer”, *Wetsteen der vernuften*, First Part, p. [xiii]; DE BIE, *Faems weer-galm der Neder-duytsche poësie*, p. 271; SWAMMERDAM, *Bybel der natuure of historie der insecten*, Part 2, p. 785.

<sup>93</sup> For example, HENRY OLDENBURG translated and published less than half of L.’s famous Letter 26 [18] L-040 of 9 October 1676, *Collected Letters*, vol. 2, about the little animals he discovered in spice infusions. In Letter L-118 to L. of 16 March 1682, in this volume, ROBERT HOOKE writes about his translations of Letter 66 [34] L-114 of 4 November 1681 and Letter 67 [35] L-116 of 3 March 1682, both in *idem*, vol. 3, “I have not exactly followed your letter word for word in the translation, but as near as possibly I could I have expressed the true sense of your expressions.”

<sup>94</sup> The French-language periodical *Le Journal des Sçavans* was published in Amsterdam. A Latin translation titled *Le Journal des scavans, hoc est: Ephemerides eruditorum* was published in Leipzig from 1667 to 1671. The *Journal*, during L.’s time issued weekly on Mondays, had summaries and translated excerpts from nine letters by L., seven written to HENRY OLDENBURG and the last two to ROBERT HOOKE. Three of the letters had figures, for a total of ten figures, but no figures were published in *Le Journal des Sçavans*. For details, see ANDERSON, Lens on Leeuwenhoek <https://lensonleeuwenhoek.net/content/journal-des-scavans>.

<sup>95</sup> Prior to 1684, L.’s letters appeared in only one other journal in French and one in Latin. “Observations Faites avec le Microscope sur le sang et sur le lait, by A. van Leeuwenhoek”, *Recueil d’expériences et observations*, published in 1679, contains excerpts selected, translated, and edited by LOUIS LE VASSEUR from *Philosophical Transactions*, Letter 5 [3] L-006 of 7 April 1674, Letter 8 [4] L-011 of 1 June 1674, Letter 9 [5] L-012 of 6 July 1674, Letter 18 [12] L-026 of 14 August 1675, *Collected Letters*, vol. 1, and Letter 37 [23] L-067 of 14 January 1678, *idem*, vol. 2. In 1682, OTTO MENCKE published “Observationes Microscopica”, *Acta eruditorum*, vol. 1, p. 321-27, a Latin translation of parts of Letter 65 [33] of 12 November 1680 with the same seven (of eight) figures as in *Philosophical Collections*, redrawn. “Observatio Dn. Leuwenhoeck De Pilis”, *idem*, vol. 2, p. 511-12, has a Latin translation of parts of Letter 66 [34] L-114 of 4 November 1681 with the same four figures as in *Philosophical Collections*, redrawn. Both letters

## ADDITIONAL LETTERS ...

misunderstood the meaning and essence of the aforesaid gentleman: so that many distinguished and learned gentlemen strongly urged his Honour to make some [discoveries] known to us communicated in his own language in our homeland. So some were recently imparted to me by an eminent gentleman<sup>96</sup>, to the satisfaction of my zeal, that I made public to the world through my printing press, and dedicate again to the honoured inventor, A. VAN LEEUWENH. Which his Honour suggested.

*The structures and workings of yeast, blood, lobster eye, the coming forth of animals beyond the light, written to Sir T. GALE. Sec. of the Roy. Society, 14 Feb. 1680<sup>97</sup>.*

*Also the shapes of the wine lees, wine, mute wine<sup>98</sup>, and blood syrup, and water, of the venae lactae, or the milk-vessels, and the chylus, or milk, of the urine and predictions of the same, of the mist in the air, a burning candle, of the deer's shape and workings, of living animals in the male seed of cockchafers, damsel flies, grasshoppers, fleas, mosquitoes, of the flea bite, of the animals of which 1,000,000,000 exist in the size of a grain of sand, written to Mr. R. HOOKE, Sec. of the Roy. Soc. on 12 Nov. 1680<sup>99</sup>.*

*And on top of that, another treatment of the living animals between our molars and teeth, of the eels in vinegar, pustules in the mouth, of the scales on our skin and their shapes, and the sweat-holes in the same, written to Sir F. ASTON. Sec. of the Roy. Soc. on 12 Septemb. 1683<sup>100</sup>.*

So is his Honour moved at last, by the solicitation of many learned and famous gentlemen, to hand over some of these letters, in order to publish the same to the world through my printing press, so his Honour presented me with an account written to Mr. F. ASTON, secretary of the Royal Society in London.

*Treating the makeup of the crystalline humor, so of various animals, birds, and fishes, the screen-like creature that appears in the eye, the moisture on the cornea, the makeup of a small vein of blood, and the outer skin of a black Moor<sup>101</sup>.*

My yet favourable promise to the satisfaction of the knowledge-seeking gentlemen, *The anatomy, growth, and death of various woods<sup>102</sup>.*

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are in *Collected Letters*, vol. 3. MENCKE would publish Latin translations of parts of 11 other letters from L. in later volumes of *Acta eruditorum* between 1685 and 1689.

<sup>96</sup> Based on VAN GAESBEECK's dedication written earlier in 1684, this gentleman is CORNELIS 's GRAVESANDE. See Letter L-145 of 1 January 1684, n. 69, in this volume.

<sup>97</sup> VAN GAESBEECK has the wrong month. Letter 62 [32] L-108 of 14 June 1680, *Collected Letters*, vol. 3, was published in his *Ondervindingen en Beschouwingen der onsigbare geschapene waarheden, etc.* This publication also contained Letter 65 [33] L-111 and Letter 76 [39] L-135 (see below, n. 87 and n. 88), although variants exist. See ANDERSON, Lens on Leeuwenhoek <https://lenonleeuwenhoek.net/content/onsigtbare-geschapene-waarheden>.

<sup>98</sup> Mute wine (*stomme wijn*) still contains unfermented sugar. See Letter 65 [33] L-111 of 12 November 1680, *Collected Letters*, vol. 3, p. 285, n. 7. For a discussion of the Dutch trade in adulterated wines, see DE BRUYN KOPS, *A spirited exchange the wine and brandy trade between France and the Dutch Republic in its Atlantic framework*, pp. 131-135.

<sup>99</sup> Letter 65 [33] L-111 of 12 November 1680, *Collected Letters*, vol. 3. Published in *Ondervindingen en Beschouwingen der onsigbare geschapene waarheden, vervat in verscheydene Brieven, geschreven aan de Wijt-heroemde Koninklijke Societeit in Engeland*, printed by VAN GAESBEECK in 1684.

<sup>100</sup> Letter 76 [39] L-135 of 17 September 1683, *idem*, vol. 4. Published in *Ondervindingen en Beschouwingen der onsigbare geschapene waarheden, Waar in gehandeld werd vande Eyerstok ende derselver ingebeeld Eyeren, etc.* This publication also contains Letter 70 [37] L-122 of 22 January 1683.

<sup>101</sup> VAN GAESBEECK's summary is almost identical to the summary in the published letter. Letter 80 [41] L-147 of 14 April 1684, *ibidem*. Published in *Ondervindingen en Beschouwingen der onsigbare geschapene waarheden, waar in gehandeld werd Over het maaksel van 't Humor Cristallinus, etc.*

<sup>102</sup> The only letter prior to 1684 that discusses the anatomy of various woods is Letter 54 [29] L-097 of 12 January 1680, *idem*, vol. 3. However, it was first published in Dutch by CORNELIS BOUTESTEYN in 1686 in *Ontledingen en Ontdekkingen van Levende Dierkens in de Teel-deelen van*



Hoping through the further intercession of various honourable gentlemen to receive the favor of his Honour, in order to obtain more from his Honour, to the delight and satisfaction of knowledge-seeking enthusiasts, then [reader] use it meanwhile to your advantage. And

Farewell  
From my printing shop  
on 24 July 1684

DANIEL VAN GAESBEEK.

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<i>Letter:</i>	<b>L-151 of sometime between August and mid-October 1684</b>
<i>Written by:</i>	FRANCIS ASTON.
<i>Manuscript:</i>	This letter is known only by reference in another letter.
<i>Summary:</i>	In this letter, FRANCIS ASTON writes to L. to inform him that his most recent letter has not been read yet because the Royal Society is not in session.
<i>Source:</i>	Letter 82 [43] L-152 of 5 January 1685 to the Royal Society.
<i>Remarks:</i>	<p>L. does not give a date for the present letter, but ASTON's previous letter to L. is Letter L-148 of 7 June 1684, in this volume, to which L. replied with Letter 81 [42] L-150 of 25 July 1686 to the Royal Society, <i>Collected Letters</i>, vol. 4. The first part of it discusses brains, blood vessels in the human eye, the skin of lepers in Harlem and of eels, and moxa, the Chinese remedy for gout. It was read in London on 3 December 1684 O.S. Thus, ASTON wrote the present letter to L. sometime after that letter was received and before the Royal Society returned from recess for a meeting on 29 October 1684 O.S. See BIRCH, <i>The History of the Royal Society of London</i>, vol. IV, p. 324, 340.</p> <p>L. did not reply to the present letter directly because he had begun addressing letters to the members of the Royal Society in general instead of to the secretary, which is how he addressed his next letter, Letter 82 [43] L-152 of 5 January 1685, <i>idem</i>, vol. 5, about salts in vinegar and wine.</p> <p>The Society read Letter 82 [43] L-152 at the meetings of 21 and 28 January 1685 O.S. Thus, ASTON wrote that it was favorably received before it was read to the Society.</p> <p>Letter 82 [43] L-152 was published in <i>Philosophical Transactions</i>, vol. 15, no. 170, dated 20 April 1685 and titled, "An extract of a letter from Mr. Anthony Leewenhoeck F. of the R. S. to a S. of the R. Society, dated from Delf, January 5th. 1685. Concerning the salts of wine and vinegar, &amp;c" Despite the spelling of his name in the title, L. signed his manuscript A.</p>

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*verscheyde Dieren, etc.* Of the six letters that VAN GAESBEECK published, the two not noted here are Letter 70 [37] L-122 of 22 January 1683 to CHRISTOPHER WREN and Letter 79 [40] L-144 of 28 December 1683 to FRANCIS ASTON (published in *Ondervindingen en Beschouwingen der onsigbare geschapene waarheden, waar in gehandelt wert vande Schobbens inde Mond, etc.*).

## ADDITIONAL LETTERS ...

VAN LEEUWENHOEK, the first use of 'van' in a letter. He then returned to A. LEEUWENHOEK and ANTONI LEEUWENHOEK for the following five letters. Finally, with Letter 50 of 14 May 1686 to the members of the Royal Society, he used ANTONI VAN LEEUWENHOEK and either that or A. VAN LEEUWENHOEK for the rest of his career. See L.'s Letter L-143 of 26 October 1683 to ASTON, in this volume, for L.'s change in the spelling of his last name. See also ANDERSON, "Your most humble servant": the letters of Antony van Leeuwenhoek".

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<i>Letter:</i>	<b>L-153 of 20 January 1685</b>
<i>Written by:</i>	FRANCIS ASTON.
<i>Manuscript:</i>	This letter is known only by reference in another letter.
<i>Summary:</i>	In this letter, FRANCIS ASTON writes to L. to inform him that his recent letter about wine was favourably received at the Royal Society.
<i>Source:</i>	Letter 84 [45] L-157 of 30 March 1685 to the Royal Society.
<i>Remarks:</i>	<p>L. had probably not received the present letter from ASTON about the positive reception of Letter 82 [43] L-152 before he sent Letter 83 [44] L-154 of 23 January 1685, <i>ibidem</i>, to the Royal Society about salts and their crystals. It was read at the meetings of the Royal Society on 25 March, 29 April, and 6 May 1685 O.S.</p> <p>Letter 83 [44] L-154 of 23 January 1685, <i>Collected Letters</i>, vol. 5, was published in <i>Philosophical Transactions</i>, vol. 15, no. 173, dated 22 July 1685 and titled, "An abstract of a letter from Mr. Leewenhoek, to the R. S. Dated Jan. 23rd, 1685; concerning the various figures of the salts contained in several substances"</p>

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<i>Letter:</i>	<b>L-155 of 13 February 1685</b>
<i>Addressed to:</i>	FRANCIS ASTON.
<i>Written by:</i>	THOMAS MOLYNEUX.
<i>Manuscript:</i>	The manuscript is to be found in London, Royal Society, no. 2445, Early Letters, M.1.103, 4 pages. A copy of the letter is to be found in the Letter Book Original 10.1, 3 pages, titled, "Mr. Tho. Molyneux to Mr. Aston being his Account of Mr. Leewenhoek, Microscopes, etc. And a further Account of the Prodigious Os Frontis in the Medicine School at Leyden."
<i>Published in:</i>	<p>T. BIRCH, 1756: <i>The History of the Royal Society of London</i>, vol. 4, pp. 365-366 (London: Millar).</p> <p>C. DOBELL, 1932: <i>Antony van Leeuwenhoek and His "Little Animals"</i>, pp. 57-</p>

58 (Amsterdam: Swets & Zeitlinger).

*Summary:* In this letter, THOMAS MOLYNEUX writes to Royal Society secretary FRANCIS ASTON about L.'s microscopes, their construction, and L.'s usage of them. MOLYNEUX complains that he did not get to see L.'s stronger microscopes. He declares that L.'s "secret" was in the grinding and polishing of the lenses. He notes L.'s lack of foreign languages and consequent extravagant reasoning.

*Remarks:* THOMAS MOLYNEUX (1661-1733), younger brother of WILLIAM MOLYNEUX (1656-1698), Irish natural philosopher and member of the Royal Society, was finishing his medical training in Leiden when he wrote this report to ASTON. His brother was an ally of *Philosophical Transactions* editor EDMOND HALLEY.<sup>103</sup> The letter, dated in Leiden on 13 February 1685 N.S. was read at the meeting of the Royal Society on 11 February 1685 O.S. After that, there would not be another letter by L. published in *Philosophical Transactions* until eight years later, in early 1693.

HALLEY and THOMAS's brother WILLIAM must have been pleased with THOMAS's report. On November 3, 1686, just twenty-five years old, THOMAS was elected a fellow of the Royal Society.

The rest of MOLYNEUX's letter was published separately as "Part of a letter from Mr. Thomas Molyneux concerning a prodigious os frontis in the medicine school at Leyden. Dec. 29th. 1684. and Febr. 13th 1684/5", *Philosophical Transactions*, vol. 15, no. 168, pp. 880-881.

The following month, on 16 March 1685, MOLYNEUX wrote another letter to ASTON (Royal Society, Early Letters, M.1.104), listing the natural curiosities preserved by Dr. PAUL HERMANN (1645-1695) and discussing JOHANNES SWAMMERDAM's (1637-1680) collection of rarities and L.'s microscopes. About L., MOLYNEUX wrote,

The glasses Mr LEWENHOECK show'd me magnified Objects no more y<sup>e</sup>n several other glasses I have seen before, & therefore discover nothing but what may easily be seen by help of other Microscopes, so an account of them would be no ways satisfactory; 'tis only his owne privat glasses which make those more then ordinary discoverys. I never heard he sold those glasses of his more common sort.

*Text:*

Leyden Febr: y<sup>e</sup> 13<sup>th</sup>—85 NS.

S<sup>r</sup>.

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<sup>103</sup> EDMOND HALLEY (1656-1742) was an English astronomer, mathematician, and meteorologist whose work charting the stars in the southern celestial hemisphere led to his becoming a fellow of the Royal Society at age 22. During his two terms as editor of *Philosophical Transactions*, volume 16 in 1686-87 and volumes 29 and 30 in 1714-19, he published only one letter by L., though he wrote with great courtesy in the letters of 1686 and 1687. From 1704 to 1742 HALLEY was the Savilian Professor of Geometry at Oxford and after 1721 the second Astronomer Royal of Britain.

I have hitherto delay'd answering your last<sup>104</sup>, because I could not give you an account of Myn Heer LEEUWENHOECK, but last week I was to wait upon him in your name<sup>105</sup>: he show'd me several things through his Microscopes, which 'tis in vain to mention here, since he himself has sent you all their descriptions at large. As to his Microscopes themselves, those, which he show'd me, in number at least a Dozen, were all of one sort, consisting only of one smal glas, ground, (this I mention because 'tis generally thought his Microscopes are blown at a Lamp, those I saw I'm sure were not) placed between two thin flat Plates of bras, about an Inch broad & an Inch & ½ long; in these two Plates there were two Spertures one before, y<sup>e</sup> other behind y<sup>e</sup> glass, which were larger or smaler, as y<sup>e</sup> glas was more or less convex, or as it magnify'd; just opposite to thees Apertures on one side was placed sometimes a Needle, sometimes a slender flat body of glas or opaque mater, as y<sup>e</sup> occasion required, uppon which, or to it's apex, he fixes whatever object he has to look uppon, then holding it up against y<sup>e</sup> Light, by help of two smal screws he places it just in y<sup>e</sup> focus of his glass, and then makes his observations<sup>106</sup>. Sutch were y<sup>e</sup> Microscopes which I saw, and thees are they he shows to y<sup>e</sup> Curious y<sup>t</sup> come and visite him, but besides thees, he told me he had another sort, which no Man living had looked through setting aside himself, thees he reserves for his own private Observations wholly, and he assured me they perform'd far beyond any y<sup>t</sup> he had showed me yet, but would not allow me a sight of them, so all I can do is barely to believe, for I can plead no experience in y<sup>e</sup> matter. As for y<sup>e</sup> Microscopes I looked through, they do not magnify mutch, if any thing more, than several Glasses I have seen, both in England & Ireland: but in one particular I must needs say they far surpass them all, that is in their extreme clearness, and their representing all objects so extrordinary distinctly. For I remember we were in a dark rome with only one Window<sup>107</sup>, and y<sup>e</sup> sun to was then of a that, yet y<sup>e</sup> Objects appeerd more fair and clear, then any I have seen through Microscopes, tho y<sup>e</sup> sun shone full uppon them, or tho they receved more then ordnary Light by help of reflectin specula or otherwise: So that I imagine 'tis chiefly, if not allone in this particular, y<sup>t</sup> his Glasses exceeds all others, which generally y<sup>e</sup> more they magnify y<sup>e</sup> more obscure they represent y<sup>e</sup> Object; and his only secret<sup>108</sup> I believe is making clearer Glasses, and giving them a better polish than others can do.

I found him a very civil comlesant man, & doughtless of great natural Abilities; but contrary to my Expectations quite a stranger to letters, master neither of Latin French or English or any other of y<sup>e</sup> modern tongues besides his own, which is a great hindrance to him in his reasonings uppon his Observations, for being ignorant of all other Men's thoughts, he is wholly trusting to his own, which I observe now and then lead him into extravagances, and suggest very odd accounts of things, nay sometimes sutch, as are wholly irreconcilable with all

<sup>104</sup> The letter from ASTON requesting that MOLYNEUX visit L. is not found. However, it must have been written after MOLYNEUX's previous letter to ASTON of 29 December 1684, a copy of which is to be found in London, Royal Society, Letter Book Original 9.139, p. 331.

<sup>105</sup> "Last week" places MOLYNEUX's visit to Delft between Monday, 5 February 1685 and Friday, 9 February 1685 N.S.

<sup>106</sup> See ZUIDERVAART & ANDERSON, "Antony van Leeuwenhoek's microscopes" and ANDERSON, Lens on Leeuwenhoek, <https://lensonleeuwenhoek.net/content/leeuwenhoeks-microscopes>.

<sup>107</sup> L. entertained most visitors in the front room on the ground floor of his house. It had two windows. Only rarely did visitors get to the upper room, what L. called his *comptoir*, which had only one window. For a detailed discussion of L.'s house, see <https://lensonleeuwenhoek.net/content/hippolytusbuurt-3>.

<sup>108</sup> In "Little Animals", pp. 330-332, DOBELL gives these secret methods several pages of guarded speculation. "All the evidence indicates that it was the method of using this apparatus which he 'kept for himself alone': his secret lay, as he tells us repeatedly, in his 'particular method of observing'".

truth<sup>109</sup>. You see S<sup>r</sup> how freely I give you my thoughts of him because you desired it.

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- Letter:* **L-156 of 19 February 1685**
- Written by:* FRANCIS ASTON.
- Manuscript:* This letter is known only by reference in another letter.
- Summary:* In this letter, FRANCIS ASTON writes to L. to inform him that his recent letter about salts was received but has not been read to the Society.
- Source:* Letter 84 [45] L-157 of 30 March 1685 to the Royal Society.
- Remarks:* The source letter, Letter 84 [45] L-157 of 30 March 1685, *Collected Letters*, vol. 5, was read and discussed at the Royal Society's meeting of 27 June 1685 O.S. (7 July 1685 N.S.).

See BIRCH, *The History of the Royal Society of London*, vol. IV, p. 407:

The latter part of Mr. LEEWENHOECK's letter of March 30, was read concerning the manner how he conceived the animals in seed to cast their first skin, having a long tail, and to be nourished by the egg; the description of the foetus of a sheep after seventeen days; of the eggs in the ovarium, two of which were red and as big as a pea, when the whole foetus was no bigger than an eighth of a pea: of the description of the animal in the seed of a rabbit: of the uterus of a rabbit two days after it had been with the buck; of another uterus after six days: of the foetus of a sheep three days old.

The secretary was ordered to return thanks to Mr. LEEWENHOECK for this curious letter, and sir JOHN HOSKYNs proposed to desire him, that he would examine, with his microscope, the eggs of silk worms, that have been impregnated, and those, that have not; it being probable, that those eggs are fit for making a farther discovery; they being likewise not difficult to procure.

This letter was published in *Philosophical Transactions*, vol. 15, no. 174, dated 22 August 1685 and titled, "An abstract of a letter of Mr. Leeuwenhoeck Fellow of the R. Society, dated March 30th. 1685. to the R. S. concerning generation by an insect".

The same day as the meeting, ASTON wrote his next letter, Letter L-158 of 27 June 1685, in this volume, as ordered.

Two years later, L. responded to HOSKYNs's request via ASTON that he examined silkworms in Letter 101 [56] L-189 of 11 July 1687 to the Royal Society, *Collected Letters*, vol. 6.

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*Letter:* **L-158 of 27 June 1685**

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<sup>109</sup> The condescending young MOLYNEUX came from higher social class than L. As part of a wealthy and distinguished Irish family, he had grown up in Castle Dillon, County Armagh, a very large country estate that dwarfed the *Gulden Hoofd* where L. lived and worked. MOLYNEUX's medical education was conducted in Latin and he knew English and French. L. knew only Dutch, so perhaps Molyneux had brought a friend from Leiden who knew Dutch.

## ADDITIONAL LETTERS ...

- Written by:* FRANCIS ASTON.
- Manuscript:* This letter is known only by reference in other letters.
- Summary:* In this letter, FRANCIS ASTON writes to L. to inform him that the members of the Society have asked him to thank L. for his latest observations, which were agreeable to them. Among other things, ASTON passes along the recommendation by JOHN HOSKYNS that L. examine silkworm eggs.
- Sources:* Letter 85 [46] L-160 of 13 July 1685 to the Royal Society.  
Letter 101 [56] L-189 of 11 July 1687 to the Royal Society.
- Remarks:* The present letter from ASTON acknowledges Letter 84 [45] L-157. ASTON apparently made no mention of the letter read at the Society's meeting on 21 February 1685 O.S. from THOMAS MOLYNEUX about his recent visit to L.'s house in Delft, Letter L-155 of 13 February 1685, in this volume. See BIRCH, *The History of the Royal Society of London*, vol. IV, p. 395.
- L. responded to the present letter with Letter 85 [46] L-159 of 13 July 1685, *Collected Letters*, vol. 5, to members of the Society. In it, L. discusses the reproduction of trees, transfer of nutrients, male and female trees, hazelnut, comparing reproduction of mammals with reproduction of plants, cross-breeding, and germination.
- Four months after it was written, this letter of 13 July 1685 was read at the end of the meeting on 4 November 1685 O.S. See BIRCH, *ibidem*, pp. 426, 427.
- Later in the meeting, after discussing a report about "the change of a girl, who had been baptized as such, into a boy", the members returned to L.
- Upon occasion of Mr. LEEUWENHOECK's letter, it being discoursed concerning the possibility of changing the nature of things, Sir JOHN LOWTHER said, that barley and big interchange or turn from four rows to two, and two to four, as the ground is better or worse. Dr. LISTER supposed changes to be accidental, such as colours in tulips and other flowers, and multiplicity of leaves in gilly-flowers; but that one plant did not change into a distinct species.
- Letter 85 [46] L-159 was published eight years later in *Philosophical Transactions*, vol. 17, no. 199, dated 30 April 1693 and titled, "A Letter from Mr. Anth. Van Leeuwenhoek concerning the Seeds of Plants, with Observations on the Manner of the Propagation of Plants and Animals".

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*Letter:* **L-160 of 3 August 1685**

*Written by:* ANTHONIE HEINSIUS.

*Manuscript:* This letter is known only by reference in another letter.

*Summary:* In this letter, ANTHONIE HEINSIUS writes from London that ROBERT BOYLE would like him to examine cochineal, among other things.

*Source:* Letter 105 [60] L-194 of 28 November 1687 to the Royal Society.

*Remarks:* HEINSIUS was in London to negotiate the status of Bantam with the British for the Dutch stadtholder WILLEM III. See n. 2 to Letter 105 [60] L-194 of 28 November 1687, *Collected Letters*, vol. 7, for more. By 1688, WILLEM would be king of England. He then appointed HEINSIUS grand pensionary (*raadpensionaris*) and delegated to him the governance of the Dutch Republic for the rest of his life.

In his reply to the present letter, Letter 86 L-162 of 10 August 1685, *idem*, vol. 5, L. reports on his investigation of cochineal, as ROBERT BOYLE requested. However, L. is on the wrong track because he thinks that cochineal, a red dye made from insects, comes from the seed of a plant. HEINSIUS's next letter to L. is Letter L-163 of 31 August 1685, in this volume. The busy statesman HEINSIUS would not write another letter to his old friend L. until Letter 313 L-515 of 28 February 1715, three decades later, *idem*, vol. 17.

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*Letter:* **L-161 of sometime between 9 August and 12 October 1685**

*Written by:* FRANCIS ASTON.

*Manuscript:* This letter is known only by reference in another letter.

*Summary:* In this letter, FRANCIS ASTON writes to L. to inform him that his recent letter about the reproduction of trees is received but has not been read to the Society.

*Source:* Letter 88 [47] L-166 of 12 October 1685 to the Royal Society.

*Remarks:* ASTON's present letter was written sometime between the Society's last session on 8 August 1685 (29 July 1685 O.S.), and L.'s next letter to the Society, Letter 88 [47] L-166 of 12 October 1685. See BIRCH, *The History of the Royal Society of London*, vol. IV p. 424.

Three months after it was written, the first part of this letter was read at the regular weekly meeting of the Royal Society on 13 January 1686 O.S. See BIRCH, *ibidem*, pp. 452, 464, 467, 468:

Part of a letter of Mr. LEEUWENHOECK, translated by Mr. LODWICK<sup>110</sup>, was read, concerning embryo-plants, which he affirmed himself to have found

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<sup>110</sup> FRANCIS LODWICK (1619–1694) was an English linguist and cloth merchant of Flemish origin who became a fellow of the Royal Society in 1681. He translated several of L.'s letters for the Royal Society in the mid-1680s, as well as works of JOHANNES SWAMMERDAM, CORNELIS BONTEKOE, and DANIEL MITZ.

## ADDITIONAL LETTERS ...

perfectly formed in some sorts of seeds, particularly the cotton-seed.

Mr. LODWICK was desired to proceed in translating the remainder of that letter.

It took almost two months for LODWICK to translate the rest of the letter and get it to another meeting, on 3 March 1686.

A part of Mr. LEEUWENHOECK's letter was read, containing his observations upon gall and the scales, and slime of the eel and the bream; which slime, he said, he had discovered to be parts of the body of the fish and to consist of a great number of vessels interwoven together; describing the manner how these vessels came out of the scales, that lie under it. The rest of the letter was referred to another meeting.

At the meeting two weeks later, there was not enough time to finish L.'s letter. "Some part of Mr. LEEUWENHOECK's letter that had not been read in the Society, was ordered to be read at the next meeting."

By the time the next meeting came, they already had another letter from L., and there is no record that they ever finished the letter of 12 October 1685. It was published in *Philosophical Transactions*, vol. 17, no. 205, dated 30 November 1693.

Beginning in 1685, the Royal Society's weekly minutes note LODWICK as the translator of seven of L.'s letters into the early 1690s. For more on L.'s translators, see HENDERSON, "Making 'the good old man' speak English: the reception of Antoni van Leeuwenhoek's letters at the Royal Society, 1673–1723".

Because of the uncompensated workload, ASTON and TANCRED ROBINSON abruptly resigned as the secretaries of the Royal Society on 9 December 1685 O.S., just a week after they had been reelected. At the next meeting, on 16 December 1685, they were replaced as secretaries by JOHN HOSKYNS, who had served as president in 1683, and THOMAS GALE.

HOSKYNS never wrote to L., GALE wrote two letters to L., and HALLEY wrote two letters and probably two more known only by reference in other letters. The letters from GALE and HALLEY are in this volume. After that, L. did not get another letter from the Royal Society until five years later, Letter L-215 of 12 February 1692 from RICHARD WALLER, *Collected Letters*, vol. 8, there unnumbered and dated 2 February 1692 O.S. See also the improved translation of Letter L-215 in this volume. During those five years, L. sent 18 letters to the Royal Society and two to ROBERT BOYLE, all unanswered. None of them was published in *Philosophical Transactions*. As a result, L. began publishing his letters in Dutch and Latin translation.

During the discussions after the reading of L.'s letters at recent meetings of the Royal Society, English physician and Royal Society member MARTIN LISTER (1638-1711) made several comments. See Letter L-146 of 7 March 1684 and LISTER's comment about skin color, Letter L-151 of sometime between August and October 1684 and his comments about the effects of chalk on vinegar, Letter L-153 of 20 January 1685 and his comments about the shape of various crystals, Letter L-158 of 27 June 1685 and his comments about the characteristics of plants, and the present letter and his comments about the mealy



substance in plants. All of these letters are in this volume. In *Philosophical Transactions*, vol. 20, no. 244, dated 30 September 1698, LISTER objected to L.'s ideas about the primacy of sperm in reproduction in a short article titled, "An objection to the new Hypothesis of the Generation of Animals from Animalcula in Semine Masculino." L. responded in detail in Letter 201 [117] L-357 of 23 June 1699 to the Royal Society, *Collected Letters*, vol. 12.

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<i>Letter:</i>	<b>L-163 of 31 August 1685</b>
<i>Written by:</i>	ANTHONIE HEINSIUS.
<i>Manuscript:</i>	This letter is known only by reference and excerpts in another letter.
<i>Summary:</i>	In this letter, ANTHONIE HEINSIUS writes from London that ROBERT BOYLE is satisfied with L.'s observations of cochineal, though he thinks it comes from insects.
<i>Source:</i>	105 [60] L-194 of 28 November 1687 to the Royal Society.
<i>Remarks:</i>	With this letter, HEINSIUS is replying to Letter 86 L-162 of 10 August 1685, in which L. reports on his investigation of cochineal. He is, however, on the wrong track because he thinks that cochineal, a red dye made from insects, comes from the seed of a plant. Based on what BOYLE relays to him through HEINSIUS, L. recants his 10 August letter in Letter 87 L-164 of 21 September 1685. Both letters are in <i>Collected Letters</i> , vol. 5, and are known only by excerpts in Letter 105 [60] L-194 of 28 November 1687, <i>idem</i> , vol. 7.

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<i>Letter:</i>	<b>L-165 of October 1685</b>
<i>Written by:</i>	KARL VON HESSEN-KASSEL.
<i>Manuscript:</i>	This letter is known only by reference in another letter.
<i>Summary:</i>	After visiting L., Landgrave KARL VON HESSEN-KASSEL writes a letter of thanks.

## ADDITIONAL LETTERS ...

- Source:* Letter 235 [146] L-403 of 20 April 1702 to KARL VON HESSEN-KASSEL.
- Remarks:* KARL VON HESSEN-KASSEL (1654-1730) visited L. in October 1685. He was accompanied by Dutch army civil engineer, explosives expert, and fountain maker WILLEM MEESTER (1653-1701) who had worked with CHRISTIAAN HUYGENS for many years.
- According to CONSTANTIJN HUYGENS in a letter of 5 November 1685 to his son CHRISTIAAN HUYGENS, *Oeuvres Complètes*, no. 2408:
- He [MEESTER] went with him [KARL VON HESSEN-KASSEL] to LEEUWENHOECK's, who wanted to show him only those of his microscopes that he shows to everyone, which little glasses had at least a focal distance equal to the back of a household knife. When the landgrave asked whether he could have some that he had made, he replied with great pride that he never gave any to anybody, had no intention of doing so, and that if once he were ever to submit to that, he would soon be the slave of everyone, and other things of that nature. After showing three or four of his microscopes, he carried them off, and went to fetch as many others, saying that he did this for fear that any of them might get mislaid in the hands of the spectators, that he did not trust people, especially Germans, repeating this two or three times. Oh, what a brute!
- Sometime before 1702, KARL's son FRIEDRICH VON HESSEN-KASSEL (1676-1751) visited L. and in April 1702, KARL's brother PHILIPP VON HESSEN-PHILIPPSTAL (1655-1721) also visited L.
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- Letter:* **L-169 of 12 March 1686**
- Written by:* THOMAS GALE.
- Manuscript:* The manuscript is lost. The copy of the letter transcribed here is to be found in London, Royal Society, Letter Book Original 11A.16, p. 38. It is titled, "An Answer to M<sup>r</sup> Leewenhoecks Letter of Octob:12 sent Mat. 0/2 St: Vet 1686." A note in the margin says "Journal No. 8 p. 64". It has no opening or closing.
- Published in:* A. VAN LEEUWENHOEK 1686: Letter 90 [49] of 2 April 1686, *Collected Letters*, vol. 6. – Extensive excerpts from GALE's letter.  
E.F. MACPIKE, ed. 1975: *Correspondence and Papers of Edmond Halley* (Oxford: Oxford University Press), letter 13. -- Reprint of 1932 Arno Press edition
- Summary:* In this letter, GALE conveys the reaction of the Royal Society to L.'s recent letter. The members propose other explanations for some of L.'s observations about cotton seeds. They concur with L.'s ideas about sweat pores in skin. They are amazed by L.'s idea, contrary to common knowledge, that the slime on an eel's skin is essential to its health. Finally, they find that L.'s ideas about the mixture of fluids in the blood is worth of further investigation because of the implications for medical practice.

*Remarks:*

Other than the letter and diploma that Royal Society secretary GALE sent in 1680 to certify L.'s election as a fellow of the Royal Society, Letter L-101 of 7 March 1680, in this volume, this 1686 letter is the only known letter to L. from GALE, who had returned to the office of secretary on 16 December 1685 after a five-year hiatus. It was written in response to L.'s Letter 88 [47] L-166 of 12 October 1685, *Collected Letters*, vol. 5.

The present letter was written by GALE just before the second of those readings. L.'s reply, Letter 90 [49] L-173 of 2 April 1686, *Collected Letters*, vol. 6, begins,

I was exceedingly pleased to read, in your favour of the 2nd/12th March, written by Your Honours' Secretary Mr. THOMAS GALE, the special expression of your appreciation, both in regard to my person and my observations contained in some of my previous letters, and to learn also the reason why my letters remained unanswered so long.

Immediately following that, L. breaks the middle two paragraphs of GALE's letter into four passages that he translates with accuracy and responds to in detail. Later that year, when L. published this letter in *Cinnaber Naturalis* (Natural cinnabar), he set these translated passages in italics. It is doubtful that L. knew enough English by 1686 to make the translations himself, but he does not mention having anyone's help.

After the fourth passage, L. paraphrases the present letter's final paragraph, but attributes it to ROBERT HOOKE.

Mr. ROBERT HOOKE requests me, in view of the lack of eggs of the silkworm this springtime, to examine the seed of frogs, and to note the manner in which nature proceeds in the reproduction of these animals; for it may be assumed (says that Gentleman), or reasonably asserted, that the generation of most, if not of all, egg-laying fishes proceeds in the same way.

This reference to HOOKE is puzzling because the previous letter that HOOKE sent to L. was Letter L-117 of 26 March 1682, in this volume, and in no prior letter to L. does he mention frogs or their reproduction. A possible solution is in the sentence that begins that final paragraph: "They have yet one further request to you." The copyist could have written "They" where the original letter that L. read could have said "Mr. HOOKE has yet one further request to you."

The copy of the present letter in the Royal Society archives is unsigned, contributing to why it is misattributed to EDMOND HALLEY in MACPIKE, *Correspondence and Papers of Edmond Halley*, along with HALLEY's statement at the beginning of Letter L-176 of 25 May 1686, in this volume, "Since my last of the 2d of March." See the Remarks to Letter L-170 of 12 March 1686, in this volume.

## ADDITIONAL LETTERS ...

*Text:*

Worthy Sr. Y<sup>rs</sup> of the 12 of Octob<sup>111</sup> to Mr ASTON<sup>112</sup> was by him safely delivered to the Royal Society, who have to great a value for so constant, and so communicative a Correspondent to let your Letters go unanswered so long; but so it is, that the Society being unexpectedly deprived of the Service of Mr ASHTON by whom the whole charge of the Correspondence was undertaken, their affairs were very much retarded thereby, and it is but lately that they have reassumed their meetings upon a new model, which they conceive may be less subject to the like inconveniences<sup>113</sup> so that for this time they beg your excuse, and promise you for the future a more ready returne of their thanks, for your ingenious, and very curious communications.

Your letter contains in it a great many particulars<sup>114</sup>, in all which you fail not to add some new discovery or to confirm the old, and especially where you tell them that the Cotton seed contains it a perfect plant capable to shift for it self without any Oleaging pabulum, as is ordinary in the seed of most other plants, to maintain its deriving its infancy, if I may so say, however they think it worth the considering whether those plants you examined might not be somewhat too old, that so the substance designed for nutriment might be dried up and extenuated so, as to pass for leaves or els whether there might not be contained within the stem which in your figures you design large<sup>115</sup>, a substance analogous to the yolk of an Egg as it is in the bellies of Chickens and undoubtedly in those insects you mention to have found without a pabulum in their shells, but this only by way of inquiry, and to know your opinion thereon: you likewise advance an opinion that the hitherto supposd pores of the skin are rather the most compact parts thereof, and that the cuticula is in those little cavities more firmly than ordinary affixt by some ligatures to the cutis, which tho it be strong is not without great shew of probability, especially if upon view the sweat be found to flow less freely through those pores than else where.

Another of your discoveries, it is to be feared, will pass for paradoxical in the judgment of most men, to wit, that whereby you find the slime of Eels, and other fish not an Excrement but a real necessary part of their bodies, and likewise to have scales of its one, this is what the Society wonders at, and would be glad they had glasses capable to shew them those miracles, which tho upon your credit they dare not disbelieve, yet their satisfaction would be more entire, could they but see them themselves<sup>116</sup>. Lastly your speculations upon

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<sup>111</sup> Letter 88 [47] L-166 of 12 October 1686, *Collected Letters*, vol. 5.

<sup>112</sup> FRANCIS ASTON (1644-1715) was first secretary of the Royal Society from 1681-1685. See Appendix 4, in this volume, for an overview of his correspondence with L.

<sup>113</sup> For details about ASTON's sudden resignation and the resulting new model of organization for the Royal Society, see the Remarks to Letter L-161 of sometime between 9 August and 22 October 1685, in this volume.

<sup>114</sup> GALE responds, in the same order, to some of the observations that L. discussed in that long Letter 88 [47] L-166 of 12 October 1685, *ibidem*.

<sup>115</sup> See Fig. 8, Letter 88 [47] L-166 of 12 October 1685, *ibidem*.

<sup>116</sup> Because the Royal Society did not have the ability to replicate all of L.'s observations, they had to accept his claims "upon your credit". Fifteen years later, Royal Society president JOHN SOMERS made a similar comment, also using "credit", in his response to L.'s announcement of the bequest of these 26 microscopes: "Such of them [L.'s observations] as have been tried by any other of their members have been so exactly verified by \* experiments, that the Society give an entire credit to your relations of matters of fact." See Letter L-395 of 15 November 1701, in this volume. After L.'s death, Royal Society vice-president MARTIN FOLKES also made a similar comment. "But we have seen so many, and those of his most surprising discoveries, so perfectly confirmed, by great numbers of the most curious and judicious observers, that

mixtures of several Chymicall liquours with the blood, are in the opinion of the Society highly worth the prosecuting, there being hopes that by this means some light may be drawn towards the discovery of the abstruse and mysterious [...] of some medicines in the body, those effects, though never so surprizing are not otherwise known than by their symptoms this therefore they recommend to your further examination with hearty wishes of success, there being scarce anything more beneficial to mankind than would be the advancement of the most Emperial art of Medicine into a scientificall knowledg.

They have yet one further request to you, that since at this time the Eggs of silkworms, and the things that happen to them could not by reason of the foregoing hard winters be observed by you, they desire you this spring to view the spawn of frogs, and to note y<sup>e</sup> method y<sup>t</sup> nature takes in y<sup>e</sup> production of those animals, for it is reasonable to suppose y<sup>t</sup> y<sup>e</sup> generation of most if not all oviparous fishes is after y<sup>e</sup> same manner.

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*Letter:* **L-170 of 12 March 1686**

*Written by:* EDMOND HALLEY.

*Manuscript:* This letter is known only by reference in another letter.

*Summary:* In this lost letter, EDMOND HALLEY writes about unknown topics.

*Source:* Letter L-176 of 25 May 1686 from EDMOND HALLEY.

*Remarks:* In E.F. MACPIKE, *Correspondence and Papers of Edmond Halley*, Letter 13 by HALLEY is actually Letter L-169 of the same date by THOMAS GALE to L., the manuscript of which is lost, but a copy of which is to be found in London, Royal Society, Letter Book Original 11A.16, p. 38. L. quotes from it extensively and accurately in Letter 90 [49] L-173 of 2 April 1686, *Collected Letters*, vol. 6, which begins, “I was exceedingly pleased to read, in your favour of the 2nd/12th March, written by Your Honours’ Secretary Mr. THOMAS GALE.”

The confusion arose from the lack of the writer’s name on the copy and HALLEY’s statement to begin Letter L-176 of 25 May 1686, in this volume: “Since my last of the 2d of March.” There is no letter by HALLEY of that date in the Royal Society’s archives, nor is there any mention of such a letter in L.’s letters.

It is also possible that the copy in the Letter Book Original was written by clerk HALLEY and signed by secretary GALE. When the Royal Society reorganized after the resignations of its two uncompensated secretaries, they listed the duties of their newly created position of paid clerk. The fourth duty was that “He shall draw up all letters, and bring them to be signed by one of the secretaries”. See BIRCH, *The History of the Royal Society of London*, vol. IV, p. 454, and Letter L-161 of sometime between 9 August and 22 October 1685, in this volume.

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there can surely be no reason to distrust his accuracy in those others, which have not yet been so frequently or carefully examined”. See Letter L-599 of late 1723, *idem*, vol. 19.

## ADDITIONAL LETTERS ...

This the first of the two known letters to L. written by HALLEY. His next letter to L. is Letter L-176 of 25 May 1686. He also probably wrote two letters from the Royal Society to L., Letter L-183 written between October 1686 and the end of that year and Letter L-184 of 24 February 1687. All three letters are in this volume. L. did not address any known letters to HALLEY.

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<i>Letter:</i>	<b>L-171 of sometime between 15 March 1686 and 17 October 1687</b>
<i>Written by:</i>	A Prussian medical doctor <sup>117</sup> .
<i>Manuscript:</i>	This letter is known only by reference in another letter.
<i>Summary:</i>	In this letter, a Prussian medical doctor asks to visit L. He sends two pieces of amber from Prussia. During his visit, he mentions a piece of “burned paper” that fell from the sky in Courland <sup>118</sup> , a piece of which he later sends to L. separately.
<i>Source:</i>	Letter 104 [59] L-193 of 17 October 1687 to the Royal Society.
<i>Remarks:</i>	L. often omits the names of his visitors and correspondents, even when they are otherwise well known. From what L. wrote in Letter 104 [59] L-193 of 17 October 1687, the doctor could have sent two letters and there is no further evidence that he ever visited.

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<i>Letter:</i>	<b>L-172 of 16 March 1686 and 17 October 1687</b>
<i>Written by:</i>	ANTONIO MAGLIABECHI.
<i>Manuscript:</i>	This letter is known only by reference in another letter.
<i>Summary:</i>	In this letter that begins their correspondence, MAGLIABECHI writes in a way that L. finds courteous and agreeable.
<i>Source:</i>	Letter 96 L-182 of 30 October 1686 to ANTONIO MAGLIABECHI.
<i>Remarks:</i>	With the present letter, ANTONIO MAGLIABECHI (1633-1714), librarian to Grand Duke COSIMO III DE’ MEDICI of Tuscany, begins his exchange of letters with L. For an overview, see VAN RIJNBERK, “De briefwisseling tusschen Leeuwenhoek and Magliabechi”. VAN RIJNBERK accounts for 38 letters. Later research has uncovered four other letters from MAGLIABECHI to L., all in this volume.

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<sup>117</sup> This Prussian medical doctor is not identified.

<sup>118</sup> At the time, Courland was an independent duchy in what is now western Latvia.

For COSIMO III, see MAGLIABECHI's Letter L-272 of 12 October 1695, in this volume.

L.'s first letter to MAGLIABECHI, Letter 91 L-174, *Collected Letters*, vol. 6, has the date of 12 April 1686. In Letter 96 L-182 of 30 October 1686, *ibidem*, L. refers to his letter of 14 April, apparently in error.

Note 2 to Letter 96 L-182, *ibidem*, p. 177, says that, by "latest observations", L. "probably refers" to *Ontledingen en ontdekkingen van het begin der planten in de zaden van boomen* (Analyses and discoveries of the beginning of plants in the seeds of trees), published in 1685. It seems more likely, however, that L. sent a Latin publication that MAGLIABECHI could read. For the same reason, he had 11 of his letters to MAGLIABECHI translated into Latin before he sent them, one translated into Italian, and one into French. In that case, L. probably sent *Anatomia et Contemplatio Nonnullorum Naturae invisibilium Secretorum* (Anatomy and Contemplation of invisible secrets of nature), also published in 1685.

L.'s reply to the present letter from MAGLIABECHI, Letter 91 L-174 of 12 April 1686, *ibidem*, was followed by three other letters before MAGLIABECHI responded: Letter L-181 of 10 September 1686, in this volume, Letter 96 L-182 of 30 October 1686, *idem*, vol. 6, and Letter L-202 of 1689, in this volume. MAGLIABECHI's next letter to L. is Letter L-209 of 27 May 1691.

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<i>Letter:</i>	<b>L-176 of 25 May 1686</b>
<i>Written by:</i>	EDMOND HALLEY.
<i>Manuscript:</i>	No manuscript is known. The copy of the letter transcribed here is to be found in London, Royal Society, Letter Book Original 11A.12, 2 pp. It is titled, "An Answer to Mr Leenwenhoecks Letter of ye 15 of May 1686. It has no opening or closing. In the margin is written, "Journ: N <sup>o</sup> . 8. p. 67."
<i>Published in:</i>	E.F. MACPIKE, ed. 1975, <i>Correspondence and Papers of Edmond Halley</i> (Oxford: Oxford University Press), letter 18. -- Reprint of 1932 Arno Press edition.
<i>Summary:</i>	In this letter, EDMOND HALLEY writes to about a gift to L. from the Royal Society and requests a few copies of L.'s recently engraved portrait.
<i>Remarks:</i>	Four days after this letter is dated, the Royal Society decided to send a gift to L. of FRANCIS WILLUGHBY's <i>De Historia Piscium</i> , which the Royal Society had just published. "It was ordered that signor MALPHIGHI, Mr. HEVELIUS, Mr. LEEWENHOECK, and Mons. BAYLE be each of them presented with one copy of Mr. WILLUGHBY's <i>History of Fishes</i> ." See BIRCH, <i>The History of the Royal Society of London</i> , vol. IV, p. 484. L. responded to HALLEY's letter in two letters, both addressed to the Royal Society and both in <i>Collected Letters</i> , vol. 6. Letter 93 [51] L-177 of 10 June 1686. L. again references HALLEY's letter in Letter 94 [52] L-178 of 10 July 1686. HALLEY's previous letter to L. is the lost Letter L-170 of 12 March 1686, in this volume.

## ADDITIONAL LETTERS ...

*Text:*

Worthy Sir

Since my last of y<sup>e</sup> 2<sup>d</sup> of March we have recieved your answer thereto, and lately another of y<sup>e</sup> fourteenth courrant<sup>119</sup>. the first has been read before the Society<sup>120</sup>, and the latter shall be as soon as translated<sup>121</sup>. the remarks that have been made thereon<sup>122</sup>, you shall shortly have by the Post, this being only intended to accompany a small present, which the Society as a mark of their respect & gratitude for the pains you take to obliging them, has thought fit to send you: 'tis a book they have printed lately at their own charges, being the Natural History of Fishes<sup>123</sup> by M<sup>r</sup> WILLOUGHBY<sup>124</sup> which you will find a work of great curiosity, the Gentleman that has undertaken to deliver it you is a very knowing & curious person, & y<sup>e</sup> Society would esteem it an obligation, if you should think fit to let him view in your most incomparable microscope some of those many curiosities, wherewith from time to time you entertain us, so much to our satisfaction. I have yet one further request to you, w<sup>ch</sup> is, that several gentlemen of the Society, who are your admirers, have heard that y<sup>e</sup> Picture is of late curiously graved<sup>125</sup> have orderd me to desire of you some few prints to adorn their studies, and one for the Societies meeting room, where you will be sure to be in good

<sup>119</sup> Letter 90 [49] L-173 of 2 April 1686 and Letter 92 [50] L-175 of 14 May 1686, both in *Collected Letters*, vol. 6.

<sup>120</sup> The letter of 2 April was presented to the Royal Society at its meeting on 14 April 1686 O.S. "A letter of Mr. LEEWENHOECK, dated April 2, 1686, N.S. being an answer to one sent him dated March 2, O.S. and giving an account, among other things, of the texture of bone viewed through a microscope, was produced, and ordered to be translated." See BIRCH, *The History of the Royal Society of London*, vol. IV, pp. 473-474.

<sup>121</sup> At the 12 May 1686 O.S. meeting of the Royal Society, "Part of a letter of Mr. LEEWENHOECK, being in answer to one written to him March 2, 1685/6, was read, and the rest referred till another meeting. Another letter of Mr. LEEWENHOECK was produced, and ordered to be translated." This "latter" letter was Letter 92 [50] L-175 of 14 May 1686, which was read at the 26 May 1686 O.S. meeting of the Royal Society. "Part of a letter of Mr. LEEWENHOECK was read, giving an account of the texture of bone, observed in his microscopes, which he found composed of four several sorts of pipes or vessels running lengthwise, and ranged in circles about the cavity, and proposing an analogy between the growth of bones and that of wood by the accession of new circles, as it is annually in trees, and comparing the periosteum to the bark of the tree." See BIRCH, *ibidem*, pp. 483, 485-486.

<sup>122</sup> These remarks are not noted in BIRCH's *History*, nor is any letter from the Royal Society to L. known between Letter L-184 of 24 February 1687, in this volume, and RICHARD WALLER's Letter L-215 of 12 February 1692, *Collected Letters*, vol. 8, there unnumbered and dated 2 February 1692 O.S. See also the improved Letter L-215 in this volume. This span of five years coincides with HALLEY's service as editor of *Philosophical Transactions*, vol. 16, from 1686 to 1687, during which time he did not publish any letters by L., and the following four years until publication was resumed in 1691 with WALLER as editor of volume 17.

<sup>123</sup> *De Historia Piscium* (The history of fishes) was published in 1686 at the expense of the Royal Society by E. Theatro Sheldoniano.

<sup>124</sup> FRANCIS WILLOUGHBY (1635-1672, also WILLOUGHBY) was an English ornithologist and ichthyologist who became a member of the Royal Society in 1661. After his death, naturalist JOHN RAY (1627-1705), also a member of the Royal Society, edited the book and brought it to publication. It did not sell well, so the Royal Society began giving it away as presents and even in lieu of salary payments to HALLEY and HOOKE. See BIRCH, *ibidem*, *passim*.

<sup>125</sup> In 1685, JAN VERKOLJE (1650-1693) made an oil portrait of the 53-year-old L. as well as a mezzotint of the same portrait, in reverse and with a few details changed. For a discussion of all the known portraits of L., see DOBELL, *Little Animals*, pp. 346-351.



company, what you shall think fit to send, you may please to deliver to this Gentleman Mr COLSON<sup>126</sup> for y<sup>e</sup> Society, & they will be sure to come to hand<sup>127</sup>.

Yrs. &c.

ED: HALLEY

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- Letter:* **L-179 of 11 July 1686**
- Written by:* JACOB GRONOVIVS.
- Manuscript:* This letter is known only by reference in another letter.
- Summary:* In this letter, JACOB GRONOVIVS writes that MAGLIABECHI, in letters to GRONOVIVS<sup>128</sup>, often mentions L. with respect and with expressions of courtesy.
- Source:* Letter 96 L-182 of 30 October 1686 to ANTONIO MAGLIABECHI.
- Remarks:* Sending someone an unsealed letter full of book news addressed to someone else was a way for MAGLIABECHI to easily broaden his network. See MAGLIABECHI's Letter L-381 to L. of mid-1701 for another example, in this volume.  
On 24 June 1687, MAGLIABECHI wrote to GRONOVIVS: "*Le moyne, Grevio, Leeuwenboeckio. Ad alcuni de' detti signori scriverò la seguente settimana*" (LE MOINE<sup>129</sup>, GRAEVIVS<sup>130</sup>, LEEUWENHOECK. I will write to some of these gentlemen the following week). LMU München, Cod 4° Cod. Msc 777, f. 8. If MAGLIABECHI wrote that letter to L., it is lost because his next known letter to L. is Letter L-209 of 27 May 1691, in this volume.

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<sup>126</sup> *Collected Letters*, vol. 6, p. 387, states that COLSON is not known. A member of the Royal Society by the name of JOHN COLSON was not born until 1680. His father JOHN COLSON had an article in *Philosophical Transactions*, vol. 11, no. 126, "Observation made of the late solar eclipse on the first of June, 1676". This JOHN COLSON ran a school to train navigators in mathematics at Marsh Yard in Wapping, a district in East London.

<sup>127</sup> Two weeks after HALLEY wrote to him, L. responded to this letter and to COLSON's visit in Letter 93 [51] L-177 of 10 June 1686, *Collected Letters*, vol. 6. He referred to the Society's request for a print of his portrait, but does not indicate that he sent it. It was not until Letter 169 [102] L-295 of 10 July 1696, *Collected Letters*, vol. 11, that L. found some prints to send.

<sup>128</sup> JACOB GRONOVIVS (1645-1716), professor of history and Greek in Leiden after 1679, corresponded with MAGLIABECHI and occasionally passed letters from him to L. See Letter L-273 of 14 October 1695, Letter L-280 of 5 November 1695, Letter L-290 of 5 June 1696, Letter L-332 of late 1697 or early 1698, Letter L-435 of sometime before March 1705, and Letter L-465 of 10 July 1708, all in this volume. For GRONOVIVS, see also the Biog. Reg., *Collected Letters*, vol. 6, p. 387 and p. 391 for speculation that it was through GRONOVIVS that MAGLIABECHI and L. first made contact.

<sup>129</sup> STEPHANUS LE MOINE (1624-1689) was a French Reformed theologian and professor at Leiden University after 1673.

<sup>130</sup> JOHANN GEORG GRAEVIVS (1632-1703) was a German classical scholar and critic who was a professor at the University of Utrecht.

## ADDITIONAL LETTERS ...

In the list of missing Leeuwenhoek letters published in 1934, GERARD RIJNBEEK, first president of the Leeuwenhoek Commission, included several letters to GRONOVIVS. (See his “Leeuwenhoek-Brieven: een oproep”). These letters are mentioned in the auction catalogue of GRONOVIVS’ library, the *Bibliotheca Gronoviana* (Leiden: HAAK, 1785), p.13, no. 104: “Brieven van LEEUWENHOECK aan J. GRONOVIVS” L. perhaps wrote these lost letters in response to some of the letters that GRONOVIVS forwarded from MAGLIABECHI.

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<i>Letter:</i>	<b>L-181 of 10 September 1686</b>
<i>Addressed to:</i>	ANTONIO MAGLIABECHI.
<i>Written by:</i>	ANTONI VAN LEEUWENHOEK.
<i>Manuscript:</i>	This letter is known only by reference in another letter.
<i>Summary:</i>	With this letter, L. sends MAGLIABECHI a copy of a recent publication through a common friend, DANIEL PAPENBROEK.
<i>Source:</i>	Letter 96 L-182 of 30 October 1686 to ANTONIO MAGLIABECHI.
<i>Remarks:</i>	<p>This letter and the printed volume to MAGLIABECHI accompanied Letter 95 L-180 of 10 September 1686, <i>Collected Letters</i>, vol. 6, to DANIEL PAPENBROEK, a Jesuit priest from Antwerp.</p> <p>L. is mistaken about the date of 14 April. Since his previous Letter 91 L-174 of 12 April 1686, <i>ibidem</i>, he had published only in Dutch, a language that MAGLIABECHI did not know. The “slight observations” that L. had printed were clearly a separate publication from the one referred to earlier in Letter 96 L-182. See Letter L-172 of 16 March 1686, in this volume. His next publication in Latin, a language that MAGLIABECHI could read, was in 1687, so perhaps he sent one of the two Dutch publications in 1686, both published by CORNELIS BOUTESTEYN in Leiden.</p> <p>In <i>ibidem</i>, p. 177, n. 2 says that L. sent this volume: <i>Ontledingen en ontdekkingen, van de cinnaber naturalis, van het been en buyd</i>, etc. (Analyses and discoveries of natural cinnabar, of bone and skin, etc.) contains five letters: Letter 89 [48] L-168 of 22 January 1686, <i>idem</i>, vol. 5, and Letter 90 [49] L-173 of 2 April 1686 through Letter 94 [52] L-178 of 10 July 1686, <i>idem</i>, vol. 6. All of these letters were written to the Royal Society.</p> <p>The other possibility is <i>Ontledingen en Ontdekkingen van Levende Dierkens in de Teel-deelen van verscheyde Dieren, Vogelen en Visschen</i> etc. (Analyses and discoveries of living animals in the generative parts of various animals, birds, and fish etc.), which contains seven letters: Letter 43 [28] L-080 of 25 April 1679 through Letter 60 [31] L-106 of 13 May 1680 and Letter 66 [34] L-114 of 4 November 1681 through Letter 68 [36] L-119 of 4 April 1682. All of these letters were also written to the Royal Society and are found in <i>idem</i>, vol. 3.</p>

GRONOVIVS's letter to L., Letter L-179 of 11 July 1686, in this volume, states that MAGLIABECHI often mentioned L. in his letters from Florence.

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<i>Letter:</i>	<b>L-183 of late 1686</b>
<i>Written by:</i>	EDMOND HALLEY (for the Royal Society).
<i>Manuscript:</i>	This letter is known only by reference in another letter.
<i>Summary:</i>	Someone from the Royal Society writes a courteous letter to L. that includes a reference to a letter that L. never received.
<i>Source:</i>	Letter 98 [53] L-186 of 4 April 1687 to the Royal Society.
<i>Remarks:</i>	<p>For the probability that this lost letter was written by the Society's paid clerk EDMOND HALLEY, see the Remarks to Letter L-184 of 24 February 1687, in this volume, the letter that the Royal Society wrote to follow up on this missing letter.</p> <p>Beginning with Letter 58 L-104 of 13 May 1680, <i>Collected Letters</i>, vol. 3, three months after he learned he had been elected as a member of the Royal Society, L. began addressing letters to the members of the Royal Society, although he continued writing to individuals, specifically the corresponding secretaries ROBERT HOOKE, FRANCIS ASTON, HANS SLOANE, RICHARD WALLER, and JAMES JURIN. In total, he addressed 117 letters to the members, the final one being Letter L-585 of 31 May 1723, <i>idem</i>, vol. 19, three months before his death.</p> <p>Eight times, L. received a letter from the Royal Society, though they were written by individual officers, two in 1686 from EDMOND HALLEY, including the present letter, five from HANS SLOANE between 1696 and 1708, and one from RICHARD WALLER in 1714. All are in this volume.</p>

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<i>Letter:</i>	<b>L-184 of 24 February 1687</b>
<i>Written by:</i>	EDMOND HALLEY (for the Royal Society).
<i>Manuscript:</i>	This letter is known only by reference in L.'s reply.
<i>Summary:</i>	Someone from the Royal Society writes a courteous letter to L. that the portraits he sent are received, wondering why he has not sent any observations recently, and enclosing numbers of <i>Philosophical Transactions</i> from "last year". There is a reference to a letter that L. never received.
<i>Source:</i>	Letter 98 [53] L-186 of 4 April 1687 to the Royal Society.
<i>Remarks:</i>	The writer is possibly one of the Society's two secretaries, THOMAS GALE or JOHN HOSKYNs. However, given the references to the portrait and

## ADDITIONAL LETTERS ...

COLSON in EDMOND HALLEY's Letter L-176 of 25 May 1686, the Society's paid clerk HALLEY seems the probable writer. For COLSON, see the footnote in that letter. For EDMOND HALLEY (1656-1742), see the Remarks to Letter L-170 of 12 March 1686. Both letters are in this volume.

L.'s previous letter to the Royal Society is Letter 94 [52] L-178 of 10 July 1686, *Collected Letters*, vol. 6. In the two years before that, he had sent an average of one letter every other month, so a seven-month drought was enough to cause the Royal Society to inquire about it. Even so, after this inquiry, L. did not get another letter from the Royal Society until Letter L-215 of 12 February 1692 (dated 2 February 1692 O.S.) from RICHARD WALLER, *idem*, vol. 8. In addition, there is no record of the Royal Society's reading one of L.'s letters between 23 November 1687 O.S., Letter 103 [58] L-192 of 9 September 1687, and 13 January 1692 O.S., Letter 116 [68] L-212 of 27 November 1692.

During those years, L. wrote 15 letters to the Royal Society. He published the first eight in *Vervolg der Brieven, geschreven aan de Wytvermaarde Koninklijke Societeit tot Londen* (Continuation of the letters, written to the well-known Royal Society in London) in 1687 and their Latin translations, *Continuatio epistolarum* (Continuation of the letters), in 1689. He published the last seven in *Natuurs Verborgentheden Ontdekt: zijnde een Tweede Vervolg der Brieven* (Nature's secrets discovered: being the second continuation of the letters) in 1689, which made up the first half of *Arcana Naturae Detecta* (The secrets of nature discovered) in 1695. These letters contain, among many other things, L.'s proof of WILLIAM HARVEY's theories about circulation of blood and the design, construction, and use of the eel viewer (*aalkijker*) that he used as his showcase demonstration for visitors. Only one of these 15 letters was published in *Philosophical Transactions*, but not until 1694.

If by "last year", L. means volume 16 of *Philosophical Transactions*, it was edited by HALLEY and contains no letters by L. His previous publication there is in vol. 15, no. 174, in 1685, edited by WILLIAM MUSGRAVE, and the following is seven years later in vol. 17, no. 196, in 1693, edited by RICHARD WALLER.

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<i>Letter:</i>	<b>L-191 of 6 August 1687</b>
<i>Addressed to:</i>	ROBERT BOYLE.
<i>Written by:</i>	ANTONI VAN LEEUWENHOEK.
<i>Manuscript:</i>	No manuscript is known.
<i>Published in:</i>	T. BIRCH, ed. 1744: <i>The Works of the Honourable Robert Boyle</i> , 5 vols. (London: A. Millar), vol. 5, p. 652. M. HUNTER, et al., ed. 2001: <i>The Correspondence of Robert Boyle, 1636-1691</i> , 6 vols. (London: Pickering & Chatto), vol. 6, p. 229.
<i>Summary:</i>	In this cover letter, L. notes that his four most recent letters have received no reply from the Royal Society.

*Remarks:* The letter in both BIRCH and HUNTER has no signature. BOYLE was an Irish philosopher, chemist, and alchemist and a founding member of the Royal Society.

The letter covered by this one, Letter 102 [57] L-190 of 6 August 1687 addressed to the Royal Society, is found in *Collected Letters*, vol. 7. The editors note that its manuscript could not be traced and that it was not published in *Philosophical Transactions*, so EMILE VAN LOO translated the letter as L. published it in *Vervolg der Brieven*, pp. 73-95.

The first third of Letter 102 [57] L-190 is also published in BIRCH, p. 652. It includes a greeting and first paragraph not published in *Vervolg der Brieven* or, consequently, *Collected Letters*. In BIRCH, the letter is addressed to “the noble lords, gentlemen, and members of the Royal Society”. It begins, “My last was of the second of July, which no doubt was duly delivered; at present, I send further some of my small observations.” Letter 101 [56] L-189 was in fact dated 11 July, *Collected Letters*, vol. 6; see *Vervolg der Brieven*, p. 53 and n. 131 below. See also HUNTER, *Correspondence of Robert Boyle*, vol. 6, p. 229, n. b.

L.’s previous letter to BOYLE, Letter L-064 of 1678, is lost, as is L.’s next letter to BOYLE, Letter L-195 of 1688. Both letters are in this volume. There is no evidence that BOYLE ever wrote a letter to L.

*Text:*

August 6, 1687

Most noble sir,

I make bold to send you under cover these my small observations, about which I also did write to the Royal Society. First, because I fancy they will be not unacceptable to your honour. Secondly, because I know, that the Royal Society do not meet at this time.

I have written four distinct letters to the Royal Society<sup>131</sup>; and although I have not received any answer hitherto, yet I do not doubt but the same have been duly delivered.

To wit, one I did write on the fourth of April 1687, in which I treat about the structure of the teeth.

Another on the ninth of May, in which I write about coffee: the third is of the thirteenth of June, in which I speak of plants: a fourth is of the eleventh of July<sup>132</sup>, in which I treat of procreation of silk worms.

I do hope, that in these foregoing, as also in this present, something may be found, which may please your honour, remaining in the mean while,

Most noble sir,  
your most humble servant,  
&c.

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<sup>131</sup> Letter 98 [53] L-186 of 4 April 1687, Letter 99 [54] L-187 of 9 May 1687, Letter 100 [55] L-188 of 13 June 1687, and Letter 101 [56] L-189 of 11 July 1687, *Collected Letters*, vol. 6.

<sup>132</sup> BIRCH’s *Works* and HUNTER’s *Correspondence* both have, erroneously, “second of July”.

## ADDITIONAL LETTERS ...

<i>Letter:</i>	<b>L-195 of 1688</b>
<i>Addressed to:</i>	ROBERT BOYLE.
<i>Written by:</i>	ANTONI VAN LEEUWENHOEK.
<i>Manuscript:</i>	This letter is known only by reference in another source.
<i>Summary:</i>	In this lost letter, EDMOND HALLEY writes about unknown topics.
<i>Source:</i>	M. HUNTER et al., eds., <i>The Correspondence of Robert Boyle</i> , vol. 6, p. 245.
<i>Remarks:</i>	“Lost letters dating from 1688 are as follows: ... No. 263 ‘Msr Leeuwenhoek’.”

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<i>Letter:</i>	<b>L-202 of 1689</b>
<i>Addressed to:</i>	ANTONIO MAGLIABECHI.
<i>Written by:</i>	ANTONI VAN LEEUWENHOEK.
<i>Manuscript:</i>	This letter is known only by reference in another letter.
<i>Summary:</i>	The content of this letter is unknown. L. sent it to MAGLIABECHI along with one of his publications.
<i>Source:</i>	Letter 115 L-210 of 18 September 1691 to ANTONIO MAGLIABECHI.
<i>Remarks:</i>	<p>An article by VAN RIJNBERK, “De briefwisseling tusschen Leeuwenhoek and Magliabechi”, lists this letter to MAGLIABECHI on p. 3150 but does not discuss it in the text of the article.</p> <p>On the assumption that L. would send a book that MAGLIABECHI could read, he probably sent <i>Continuatio Epistolarum</i> (Continuation of the Letters), published in 1689 and containing eight letters: Letter 98 [53] L-186 of 4 April 1687, <i>Collected Letters</i>, vol. 6, through Letter 105 [60] L-194 of 28 November 1687, <i>idem</i>, vol. 7.</p>

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<i>Letter:</i>	<b>L-205 of 6 March 1689</b>
<i>Written by:</i>	CHRISTIAAN HUYGENS.
<i>Manuscript:</i>	The manuscript is lost. The summary is to be found in the Huygens Collection, University Library, Leiden.
<i>Published in:</i>	J. BOSSCHA, ed., 1901: <i>Oeuvres complètes de Christiaan Huygens</i> , vol. IX. <i>Correspondence 1685-1690</i> (La Haye: Martinus Nijhoff), p. 310, no. 2532.

*Summary:* In this letter, CHRISTIAAN HUYGENS thanks L. for the gift of a mangrove tree and inquires whether L.'s observations of the circulation of the blood could also be seen in the wings of bats, the legs of ducks, and the ears of rats.

*Remarks:* This letter is known only by the summary in *Oeuvres complètes*. HUYGENS's previous letter to L. is Letter L-050 of 9 February 1677, in this volume. L. replied to it with two letters, Letter 30 L-051 of 15 February 1677, *Collected Letters*, vol. 2, and Letter 46 L-084 of 15 May 1679, *idem*, vol. 3, about the ciliary motion of the little animals. HUYGENS made no known reply to either letter.

A decade later, HUYGENS sent the present letter about mangrove trees and blood circulation. There is nothing in any of L.'s letters about mangroves. However, in Letter L-167 of 17 December 1685, copied in its entirety in L.'s Letter 109 [64] L-199 of 24 August 1688 to the Royal Society, *idem*, vol. 7, there unnumbered, CONSTANTIJN HUYGENS asks L. whether he knows anything about root-trees and mentions his son CHRISTIAAN. In the previous year, L. published Letter 110 [65] L-200 of 7 September 1688 separately as *Den waaragtigen omloop des bloeds* (The true circulation of the blood). It is perhaps to this publication that HUYGENS is referring. L. finally replied six months later with his last letter to HUYGENS, Letter L-207 of October 1689, in this volume, about some books he sent to HUYGENS's father CONSTANTIJN HUYGENS in England.

*Text of Huygens's summary:*

6 Mart 1689.

LEEUVENHOECK bedanckt voor sijn wortelboom: gevraeght nae de observatie van 't circuleeren van 't bloedt, waerom niet in druck en komt. geproponceert of men deselve in de vleugens van vleermuyzen, pooten van Endvogels, ooren van ratten &c. niet soude kunnen sien.

*English translation:*

6 March 1689

LEEUVENHOECK thanked for his mangrove: asked about the observation of the circulation of the blood, why not in pressure and comes. Proposes whether they couldn't be seen in the wings of bats, legs of ducks, ears of rats etc.

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*Letter:* **L-207 of October 1689**

*Addressed to:* CHRISTIAAN HUYGENS.

*Written by:* ANTONI VAN LEEUVENHOEK.

*Manuscript:* This letter is known only by reference in a letter from HUYGENS.

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- Summary:** In this letter, L. tells HUYGENS that he sent four copies of his most recently published book via Rotterdam skipper JEROEN VINCK to his brother CONSTANTIJN HUYGENS in London, one for the Queen, one for himself, one for Dr. STANLEY, and the last one for the Royal Society.
- Source:** Letter 2552 of 18 October 1689 from CHRISTIAAN HUYGENS to his brother in London, *Oeuvres complètes. Tome IX. Correspondence 1685-1690* (1901).
- Remarks:** This letter is the last of three known letters from L. to CHRISTIAAN HUYGENS. It is not clear which volume L. sent to London. In January, he had sent to Boyle a copy *Continuatio Epistolarum, Datarum Ad longe Celeberrimam Regiam Societatem Londinensem* (Continuation of the letters, given to the most famous Royal Society of London), published in Leiden in 1689 by CORNELIS BOUTESTEYN. L. probably sent *Tweede Vervolg der Brieven* (Second Continuation of the Letters), also published in 1689 but in Delft by ANDRIES VOORSTAD. It contains Letter 106 [61] L-196 of 25 May 1688, *ibidem*, through Letter 114 [67] L-206 of 1 April 1689, *idem*, vol. 8, all written to the Royal Society. Again, none of these letters was published in *Philosophical Transactions*.  
Both MARY II (1662-1695), queen of England, Scotland and Ireland, and her personal chaplain WILLIAM STANLEY (1647-1731) tried to visit L. in 1688 before she left for England to assume the thrones with her husband WILLEM, the Dutch stadtholder. For STANLEY's only letter to L., see Letter L-211 of 21 September 1691, in this volume.

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- Letter:** **L-208 of 6 March 1690**
- Written by:** CHRISTIAAN HUYGENS.
- Manuscript:** No manuscript is known. A summary is to be found in the Huygens Collection, University Library, Leiden.
- Published in:** J. BOSSCHA, ed., 1901: *Oeuvres complètes de Christiaan Huygens*, vol. IX. Correspondence 1685-1690 (La Haye: Martinus Nijhoff), p. 390, no. 2571, 1 figure.
- Summary:** With this letter, CHRISTIAAN HUYGENS sends L. a copy of his recently published book, *Traité de la lumière*,<sup>133</sup> and a small piece of what he calls Iceland crystal.<sup>134</sup> He asks whether L. can extract any water from it. He also writes about L.'s experiments with a hollow glass ball and how liquids

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<sup>133</sup> *Traité de la Lumière: Où Sont Expliquées les Causes de ce qui Luy Arrive Dans la Reflexion & Dans la Refraction* (Treatise on light: In which are explained the causes of that which occurs in reflection & refraction) was published in 1690 by PIERRE [PIETER] VAN DER AA in Leiden. It introduced HUYGENS's wave theory of light in opposition to both DESCARTES's *Dioptrique* and NEWTON's particle theory of light.

<sup>134</sup> Iceland crystal, now known as Iceland spar, is a transparent calcite used by HUYGENS to study the polarization of light.



behave in it.<sup>135</sup>

*Remarks:* This letter is known only by the summary in *Oeuvres complètes*.

*Text of Huygens's summary:*

Aen ANT. VAN LEEUWENHOECK.  
den 6 Mart. 90.

Sendt een Exemplaar van mijn boeck. Heb gedacht op sijn Experiment met den glazen bol in plaets van mijn vlacke cylindrische vat. Waerom dat sijn bol niet soo bequaem daertoe is. te weten om dat het lack in 't eerst van 't draeijen, moeijte heeft om naer AB op te klimmen.



En daer nae als het glas vast gehouden werdt, soo is het lack genegen om nae C te trecken, waer door van het glas af gaet in E en F komt, en eerst weer op den grond moet sacken eer het nae 't midden D sich begeeft. daer om de vlacke bodem beter is. 't waer goet oock gewicht aen 't vat te voegen om in 't eerst beter te draeijen. Men kan een platte open doos van blick laeten maecken en met een glas toe decken. Ick send een stuckje Yslands Cristal om te sien of daar water uyt te halen is door sijn distillatie. sal bij gelegenthejdt grooter senden.

*English translation:*

To ANT. VAN LEEUWENHOECK.  
the 6th of March. 90.

I did send him a copy of my book. I have been thinking about his experiment with the glass ball instead of my flat cylindrical vessel. This is why his ball isn't so suitable for that. That is that at the start of turning the paint has difficulty climbing to AB.

<sup>135</sup> Six years after this event, L. mentions these experiments with a hollow glass ball, in Letter 168 [101] L-294 of 10 July 1696 to NICOLAAS WITSEN, *Collected Letters*, vol. 11. In it, L. recalls a visit from HUYGENS when they discussed his experiments: "A few years ago, when Mr. CHR. HUYGENS of Zuylighem did me the honour of visiting me, our conversation turned to the motion of the Earth, on which occasion I produced a Flask fitted as shown in the accompanying drawing. And when I set the Flask in motion, the said gentleman took such pleasure in it that I felt obliged to present him with such a Flask, with which he was quite pleased." See SNEELDERS, "L.'s mechanistic view", p.p. 73-76.

## ADDITIONAL LETTERS ...



And since the glass is held steady, the glass is also inclined to move towards C, which causes it to move away from the glass into E and F, and must first sink back to the ground before it moves to the center D. That's why the flat bottom is better. It would also be good to attach weight to the barrel so that it turns better in the beginning. One can have made a flat, open box of tin, and cover it with a glass.

I send him a piece of Icelandic crystal to see if water can be extracted from it by his distillation. On another occasion I will send a larger one.

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*Letter:* **L-209 of 27 May 1691**

*Written by:* ANTONIO MAGLIABECHI.

*Manuscript:* This letter is known only by reference in another letter.

*Summary:* In this letter, MAGLIABECHI writes with what L. calls “courtliness and gratitude” that the book L. sent two years previously finally arrived. He also tells L. that some of L.’s observations that MAGLIABECHI shared with GOTTFRIED LEIBNIZ satisfied him. MAGLIABECHI also sends a “little book” by BERNARDINO RAMAZZINI<sup>136</sup> dedicated to MAGLIABECHI and news of other books published recently in Italy.

*Source:* Letter 115 L-210 of 18 September 1691 to ANTONIO MAGLIABECHI.

*Remarks:* During the 19 months between Letter 114 [67] L-206 of 1 April 1689 and Letter 116 [68] L-212 of 27 November 1691, *Collected Letters*, vol. 8, both to the Royal Society, L. wrote only Letter 207 of October 1689 to CHRISTIAAN HUYGENS, in this volume, and Letter 115 L-210 of 18 September 1691, *ibidem*, addressed to MAGLIABECHI in reply to the present letter.

The notes to Letter 115 L-210 speculate about which “little book” L. sent, explain that WILLEM BLAEU translated MAGLIABECHI’s letter into Dutch and L.’s reply into Italian, and name RAMAZZINI’s treatise, *De*

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<sup>136</sup> BERNARDINO RAMAZZINI (1633-1714) was an Italian who got his medical degree from the university in Parma in 1659 and in 1682 became a professor at the University of Modena. His most consequential writings improved the medical treatment of ordinary workers by detailing their health hazards and emphasizing prevention over curing. His book *De Constitutione annorum 1691 ac de rurali epidemia dissertatio* (“The conditions of 1691 and the rural epidemic”, a series of annual reports that RAMAZZINI published from 1690 to 1694. The 1690 report is dedicated to MAGLIABECHI.

*constitutione anni 1690, ac de rurali epidemia quae Mutinensis agri et vicinarum regionum colonos graviter afflixit* (The conditions of the year 1690, on the rural epidemic, which severely damaged the residents of Modena and the neighbouring regions).

MAGLIABECHI would inform L. about RAMAZZINI's activities, as well as annual updates on the epidemic report, in later letters, Letter L-219 of 24 June 1692, Letter L-238 of before 2 March 1694, Letter L-275 of 23 October 1695, Letter L-290 of 5 June 1696, and Letter L-359 of 8 September 1699, all in this volume.

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<i>Letter:</i>	<b>L-211 of 21 September 1691</b>
<i>Written by:</i>	WILLIAM STANLEY.
<i>Manuscript:</i>	This letter is known only by reference in another letter.
<i>Summary:</i>	In this letter, STANLEY writes that the members of the Royal Society want to be of service to L.
<i>Source:</i>	Letter 116 [68] L-212 of 27 November 1691 to the Royal Society.
<i>Remarks:</i>	WILLIAM STANLEY (1647-1731) got his B.A. degree from St. John's College at Cambridge and his M.A. degree at Corpus Christi College, Cambridge, in 1670. In 1685, the Archbishop of Canterbury conferred on him the degree of D.D. (Doctor of Divinity) and he was appointed Court Chaplain to MARY STUART. STANLEY stayed with her in Holland from 1685 to 1689. See the Biogr. Reg., <i>Collected Letters</i> , vol. 8, pp 353-355. In 1689, according to L.'s Letter L-207 of October 1689 to CHRISTIAAN HUYGENS, in this volume, L. sent a copy of one of his books to CONSTANTIJN HUYGENS in London to present it to STANLEY.

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<i>Letter:</i>	<b>L-215 of 12 February 1692</b>
<i>Written by:</i>	RICHARD WALLER.
<i>Manuscript:</i>	The manuscript of this original English letter is to be found in London, Royal Society, Early Letters W3.88, undated, 2 pp.
<i>Published in:</i>	A. VAN LEEUWENHOEK, 1693: <i>Derde vervolg der brieven</i> , etc., pp. 430-433 (Delft, H. VAN KROONEVELT); 1 figure. (Dutch translation) A. VAN LEEUWENHOEK, 1695: <i>Arcana naturae detecta</i> , pp. 282-284 (Delphis Batavorum, H. A KROONEVELD); 1 figure. (Latin translation) ANTONII A LEEUWENHOEK, 1722: <i>Arcana naturae detecta</i> , pp. 259-261. (Lugduni Batavorum, J. A. LANGERAK); 1 figure. (Latin translation) <i>Alle de Brieven / The Collected Letters of Antoni van Leeuwenhoek</i> , vol. 8, p. 332-341 [in re-translation from the Dutch and Latin translations]

## ADDITIONAL LETTERS ...

*Summary:* In this letter, WALLER acknowledges the receipt of letters from L. and comments upon the subjects dealt with in those letters concerning the presence of air in the blood, the opening of the chyle-vessels into the intestine, and the occurrence of stones in the bladder. WALLER describes the structure of a grass-spikelet on the accompanying engraving.

*Remarks:* With this letter, WALLER begins the exchange of letters with L. that would span more than twenty years. L. published the present letter from WALLER in *Derde vervolg der brieven* (Third continuation of the letters) and *Arxana naturae detecta* (Secrets of nature revealed). He left it undated, had it translated into Dutch and Latin, and placed the unattributed translations between what is now Letter 119 [71] L-216 of 7 March 1692, *Collected Letters*, vol. 8, and Letter 120 [72] L-217 of 22 April 1692, *idem*, vol. 9, which was his response to WALLER.

At the end of Letter 119 [71] L-216, after his name, L. added:

“The Missive from His Honour the Secretary written to me  
I have received after completing the present.  
I will shortly reply to it.”

*Collected Letters*, vol. 8, p. 333, says that the manuscript is lost and dates WALLER’s letter 2 February 1692 because L. began his response in Letter 120 [72] L-217, “In Your Honour’s agreeable letter of 2 February 1691/2 S.V.” Thus, the English translation in *Collected Letters* must have been made from the 1692 Dutch translation of WALLER’s letter.

However, the manuscript of WALLER’s letter is *not* lost. It is among the Royal Society’s Early Letters, where it is noted as having no date. Comparing it to the English translation of the 1692 Dutch translation shows multiple differences as well as several mistranslations.

The footnotes to the transcript of WALLER’s manuscript below are formatted as follows: WALLER’s phrase from his manuscript is followed by the Dutch translation in *Derde vervolg der brieven*, followed by the English re-translation in *Collected Letters*, vol. 8.

### *Text of the original English letter:*

Worthy Sr

Yo<sup>rs</sup> of y<sup>e</sup> 27 of Nov.<sup>137</sup> and of y<sup>e</sup> 1st of this month<sup>138</sup> we rec’d and produced them in a meeting of y<sup>e</sup> R. S. where to y<sup>e</sup> satisfaction of all y<sup>e</sup> members present they were read and thanks ordered to bee returned you for yo<sup>r</sup> kind communications wishing you all y<sup>e</sup> success you can desire yo<sup>r</sup>selfe and encouraging you to proceed in discoveryes of this nature, since none are so well furnisht with an apparatus or have made better use thereof in microscopical

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<sup>137</sup> “27 of Nov.” in the manuscript translated into Dutch as *17den. November*, re-translated into English as “November the 17<sup>th</sup>”. WALLER refers to Letter 116 [68] L-212 of 27 November 1691.

<sup>138</sup> “this month” translated as *passato*, translated as “last month”. WALLER refers to Letter 118 [70] L-214 of 1 February 1692 and Letter 119 [71] L-216 of 7 March 1692, both in *Collected Letters*, vol. 8.

observations than yourselfe. They were much pleased with yo<sup>r</sup> discoverys & what you write of y<sup>e</sup> circulation of y<sup>e</sup> blood, tho some question'd whether if air were mixt with y<sup>e</sup> blood it were possible to observe it since y<sup>e</sup> microscope shews no air bubbles in water yet upon exhaustion in y<sup>e</sup> air Pump it affords plenty of air bubbling & boyling out of it, so that the air may be so intimately & in minimie intermixt with y<sup>e</sup> blood<sup>139</sup> as to escape y<sup>e</sup> view even by yo<sup>r</sup> excellent Microscopes.

As to what you write of y<sup>e</sup> smallness of y<sup>e</sup> lacteals at their insertion into y<sup>e</sup> gutts and that y<sup>e</sup> Chyle rather transudes the membranes than has any open<sup>140</sup> it is probable that usually & naturally y<sup>e</sup> passage is indeed very small, yet there are instances of some that upon drinkeing Chalybeat waters<sup>141</sup> have voyded caraway seeds<sup>142</sup> by urine which they Eat with their waters and how that can bee except there bee at sometimes at least a large passage out of y<sup>e</sup> Intestines is hard to bee answer'd.

Yo<sup>r</sup> observations on y<sup>e</sup> chalk stone of gouty persons are curious usefull & instructive & what you say of y<sup>e</sup> Male Children of poor people being more subject to y<sup>e</sup> stone has not that I know or can hear of bin taken notice of here, drinkeing large quantitys of small drinke<sup>143</sup> may be a good preventative against the painful disease<sup>144</sup>.

Wee desire y<sup>e</sup> continuation of yo<sup>r</sup> researches and that we may partake of yo<sup>r</sup> labours<sup>145</sup>. my selfe have the last summer made some observations on y<sup>e</sup> huskes beards & flow'ry attire of several grasses & corns<sup>146</sup> and find tho they differ all from each other in the size & figures of their parts yet they agree in y<sup>e</sup> number of severall of those parts, no grass that I have yet seen haveing more or fewer than two of those featherlike spriggs growing out of y<sup>e</sup> top of each seed which dry away & at last disappear as the seed increases<sup>147</sup>. Nor have any of them had more or less than three of those Pendulous Apices<sup>148</sup> which proceed and

<sup>139</sup> “so that the air may be so intimately and in minimie intermixed with the blood” translated as *soo dat de lugt op soo innerlijk een nyse, ende met sulke alderkleinste deeltigens met het bloet kan gemengt wesen*, translated as “so that the air may be mixed with the blood in such an intrinsic way, and in such extremely minute particles”.

<sup>140</sup> “As to what you write of the smallness of the lacteals at their insertion into the gut and that the chyle rather transudes the membranes than has any open”, translated as *Aangaande het geen UE. segt van de dunghydt der klynedarmen daerse met de andere darmen gevoegt zijn, en dat het Chyl de vlijes eerder als sneevende door dringt, dan dat het eenige opene passagie heeft*, translated as “With respect to what Your Honour says about the thinness of the small intestines, where they are joined to the other intestines, and that the Chyle penetrates the pellicles as it were floatingly, rather than having any open passage”. WALLER’s use of “transudes” to mean the gradual passage of a fluid through the pores in a membrane is now considered archaic.

<sup>141</sup> “chalybeate waters” translated as *gestaelde-wateren*, translated as “steeled waters”.

<sup>142</sup> “caraway seeds” translated as *kerrel-saetjes*, translated as “chervil seeds”.

<sup>143</sup> “small drink” translated as *dun bier*, translated as “small beer”. WALLER’s use of “small” to mean “weak” is now considered archaic.

<sup>144</sup> “disease” translated as *quaat*, translated as “evil”.

<sup>145</sup> Here inserted *Om iets ook aen UE. te communiceren, schoon het UE. kennisse, kwalik weerdig is*, translated as “In order also to communicate something to Your Honour, although it is hardly worthy of Your Honour’s knowledge”. Throughout the letter, WALLER’s familiar “you” is translated as the formal *UE.*, translated as “Your Honour”.

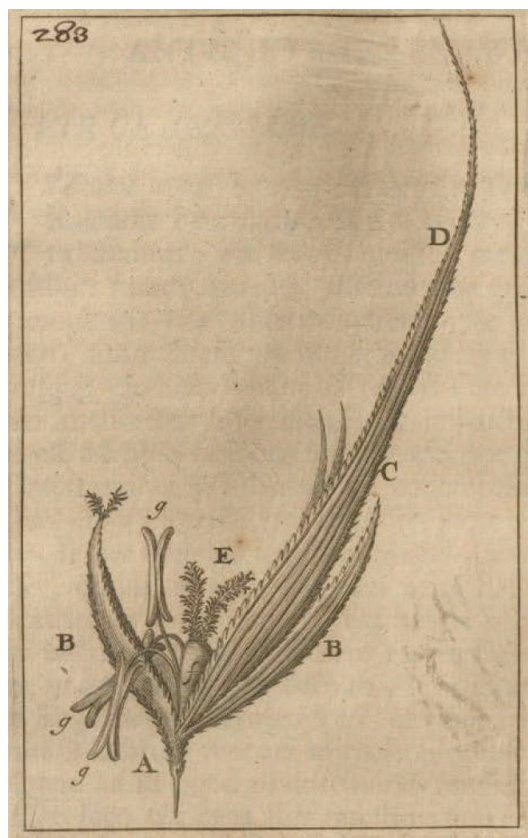
<sup>146</sup> “huskes, beards and flowery attire of several grasses and corns” translated as *de basten, airen en bloemagtige cieraat van verscheide soorten van Koorn en Gras*, translated as “rinds, ears and flowery ornament of several species of Corn and Grass”.

<sup>147</sup> “as the seed increases” translated as *als het saet toe neemt [en groot wort]*, translated as “as the seed increases [and gets big].”

<sup>148</sup> “Pendulous Apices” translated as *hangende Toppen [of kamertjes]*, translated as “hanging Tops (or cavities)”. “Apices” is the plural of “apex”.

## ADDITIONAL LETTERS ...

hang by long silver threads from y<sup>e</sup> basis<sup>149</sup> of y<sup>e</sup> seed most if not all of these Apices are bifurcated<sup>150</sup> at Each End, & are fastend by y<sup>e</sup> midst to y<sup>e</sup> silver string. These Apices are some yellow & whitish & some few purple some of them are speckt like y<sup>e</sup> leaves of Martagen flow<sup>rs</sup><sup>151</sup>. All the beards<sup>152</sup> of those grasses that have any are beset<sup>153</sup> round with prickles like the sweet bryar<sup>154</sup>. What the use of these Parts are I cannot yet satisfy my selfe in but their necessity is evident from their constant concomitancy of every seed<sup>155</sup>. I have sent you the fig. of all these Parts magnifyd as I found them in a sort<sup>156</sup> of Oate grass that you may y<sup>e</sup> better understand what I have written



<sup>149</sup> “the basis” translated as *de basis* [*of onderste*], translated as “the base [or bottom]”.

<sup>150</sup> “bifurcated” translated as *in twee gesplits*, translated as “split in two”.

<sup>151</sup> “speckt like y<sup>e</sup> leaves of Martagen flow<sup>rs</sup>” translated as *met een duystere coleure gesprenckeld*, translated as “sprinkled with a dark colour”. Known in Europe since 1568, the martagen lily (also called Turk’s cap) is native to Europe and Asia.

<sup>152</sup> “the beards”, translated as *de baerden*, translated as “awns”.

<sup>153</sup> WALLER’s use of “beset” to mean “covered or studded with” is now considered archaic.

<sup>154</sup> “sweet bryar” translated as *Eglantier*, translated as Eglantine.

<sup>155</sup> “from their constant concomitancy of every seed” translated as *terwijlse gedueriglijk elk zaetje vergeselschappen*, translated as “since they invariably accompany every little seed”.

<sup>156</sup> “a sort of oat grass” translated as *een soorte van havergas*, translated as “a species of oat-grass”.

where A represents the stalke BB the two outward husks<sup>157</sup> or chaff, C an Inward husk or gluma<sup>158</sup> D the Beard<sup>159</sup> armed with prickles. E the two feathers [small plumes] on y<sup>e</sup> top of the seed. f the young seed & ggg the three Apices or bifurcated heads [three apices (tops, cavities) or split heads] hanging at y<sup>e</sup> Ends of silver threads or stamina<sup>160</sup>.

I conclude with wishing you all happiness and that I may bee the hand to convey yo<sup>r</sup> curious discoveries<sup>161</sup> to y<sup>e</sup> R.S. my chief ambition being to serve y<sup>e</sup> learned world & amongst y<sup>e</sup> rest yo<sup>r</sup> selfe who am etc.<sup>162</sup>

*Letter:* **L-219 of 24 June 1692**

*Written by:* ANTONIO MAGLIABECHI.

*Manuscript:* No manuscript is known.

*Published in:* A. MAGLIABECHI, 1693: “Italiaansch Nieuws”, *De Boekzaal van Europe*, March and April 1693, pp. 331-334. – Dutch translation of part of the original Italian letter.

*Summary:* In this letter, MAGLIABECHI reports on several recent books that he thought might be of interest to L. They were written in Latin or Italian by some fellow Italians.

*Remarks:* In most of his letters to L., MAGLIABECHI mentions books, newly printed in Italy, that he thought might be of interest. L. gave those sections of MAGLIABECHI’s letters to PIETER RABUS,<sup>163</sup> in Rotterdam, who in 1692 had started the journal *De Boekzaal van Europe*. In it, RABUS published these excerpts from L.’s letters as “Italian Book News”.

Since these letters do not deal with L.’s research, the text concerning the books is not included here. For the complete Dutch text, see PIETER RABUS’s *Boekzaal*, which is available online. A full English translation of each letter is to be found at ANDERSON, Lens on Leeuwenhoek.

<sup>157</sup> “husks” translated as *basten of kaff*, translated as “rinds or chaff”

<sup>158</sup> “an inward husk or gluma” translated as *een invvendige bast*, translated as “internal rind”.

<sup>159</sup> “the beard” translated as *den baerd [of ayre]*, translated as “the awn (or ear)”.

<sup>160</sup> “or stamina” not translated.

<sup>161</sup> “curious” translated as *curieuse*, translated as “remarkable”.

<sup>162</sup> The manuscript ends here. However, when the clean copy was made to send to L., WALLER could have added this salutation, which appears in the Dutch and English translations: *UE. Onderdanigen Dienaar* RICHARD WALLER. *Secretaris van de Koninklijke Societeyt. sic sub.*, translated as “Your Honour’s humble Servant RICHARD WALLER. Secretary of the Royal Society. sic sub.”

<sup>163</sup> PIETER RABUS (1660-1702), first worked as a *praeceptor* at Latin school in Rotterdam. In 1684 he became a notary in that city. The same year he married the daughter of a prosperous cloth merchant, IZAAK OSTENS, perhaps an old business associate of VAN LEEUWENHOEK. In 1692 RABUS founded the first Dutch-language scholarly journal *De Boekzaal van Europe*, issued bimonthly by the Rotterdam publisher PIETER VAN DER SLAART. After a conflict between VAN DER SLAART and RABUS, the latter continued until his death in 1702 with a new magazine entitled *Twee-Maandelijke Uittreksels*. In both journals RABUS published several letters by – or to – VAN LEEUWENHOEK.

## ADDITIONAL LETTERS ...

This letter is the first of the fourteen letters with book news published in thirteen *Boekzwaal* articles from March 1693 to October 1699. MAGLIABECHI's previous letter to L. is Letter L-209 of 27 May 1691, in this volume, to which L. replied with Letter 115 L-210 of 18 September 1691, *idem*, vol. 8.

L. does not refer to this letter in any of his own letters, nor is it noted in VAN RIJNBERK, "De briefwisseling tusschen Leeuwenhoek and Magliabechi".

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<i>Letter:</i>	<b>L-235 of 24 January 1694</b>
<i>Addressed to:</i>	RICHARD WALLER.
<i>Written by:</i>	ANTONI VAN LEEUWENHOEK.
<i>Manuscript:</i>	The manuscript is to be found in London, Royal Society, MS. 1957, Early Letters L2.48, 1 p.
<i>Published in:</i>	Not published.
<i>Summary:</i>	In this cover letter for Letter L-233, L. inquires about recent letters to which he had not received a reply.
<i>Remarks:</i>	It is not clear why L. wrote a cover letter in February for a letter dated three weeks previously, perhaps indicating a lost letter. In <i>Collected Letters</i> , vol. 9, the manuscript for this letter is correctly located but the text was not included.

### *Dutch text:*

d' H<sup>r</sup>: RIC: WALLER

Wel Edele Hoogh geleerde Heer:

Mijn laasten alder onderdanigsten aan sijne Wel Ed: is geweest den 19e. der voorledene maant, die ik wil hoopen dat wel ontfangen is. Hier nevens gaan weder eenige van mijne geringe aantekeningen en sal int kort nog eenige ontdekkingen sijne Wel Ed. laten toe komen. en sal na presentatie van mijn geringen dienst soo aan sijn, Hoogh Edele als aan de Hoogh Ed: Heren leden vande Co: So: blijven.

Wel Ed: Hoogh geleerde Heer.

Sijne Hoogh Ed: onderdanige dienaar

ANTONI VAN LEEUWENHOEK.

Delft desen 12 Feb. 1694



*English translation:*

Mr. Ric. Waller  
Noble learned sir:

My last most humble was sent to his Honour the 19th of the previous month<sup>164</sup>, which I will hope has been received. Here again are some of my minor notes, and I will shortly send some more discoveries<sup>165</sup> to his Honour, and will remain, after presentation of my minor service, to his Honour as well as to the gentlemen of the Royal Society,

Noble learned sir.  
His Honour's humble servant

ANTONJ VAN LEEUWENHOEK.

Delft on 12 Feb. 1694

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<i>Letter:</i>	<b>L-238 of sometime before 2 March 1694</b>
<i>Written by:</i>	ANTONIO MAGLIABECHI (A very learned gentleman).
<i>Manuscript:</i>	No manuscript is known.
<i>Published in:</i>	A. MAGLIABECHI, 1695: "Italiaansch Boek-nieuws", <i>De Boekzaal van Europe</i> , March and April 1695, pp. 359-360. – Dutch translation of part of the original Latin or Italian text. A. MAGLIABECHI, 1695: "Extrait d'une lettre ecrite de Florence", <i>Journal des Scavans</i> , vol. 23, 21 February 1695, p. 143. – Report in French of the first part of the letter, there dated 19 November 1694.
<i>Summary:</i>	"A venerable very learned gentleman" sends L. a printed summary of a book by an Italian priest who is a proponent of ARISTOTLE's theory of spontaneous generation and is very eager to learn more about L.'s observations. He encloses news about recently published and forthcoming books by fellow Italians.
<i>Remarks:</i>	Rabus regularly published excerpts from MAGLIABECHI's letters to L. This letter is the second of the fourteen letters with book news published in thirteen <i>Boekzaal</i> articles from March 1693 to October 1699. What is known about the other parts of the present letter comes from L.'s reference to it in two later letters to the Royal Society. In Letter 134 [80] L-239 of 2 March 1694, <i>Collected Letters</i> , vol. 10, p. 31, L. writes,

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<sup>164</sup> Letter L-232 of 19 January 1694 was a cover letter for Letter L-231 of 20 December 1693 to the Royal Society about spiders, lice, and mites.

<sup>165</sup> L.'s next letter is Letter L-236 of 24 February 1694 to the Royal Society about his experiments with phosphorus.

## ADDITIONAL LETTERS ...

I have had sent to me the summary of a book printed at Rome and edited by Father PHILIPPUS BONNANIUS S.J., in which the latter maintains that animate beings spring from inanimate beings, such as Shellfish from mud, and also animalcules from water, flowers, fish, and rotten flesh.

In Letter 137 [83] L-242 of 30 April 1694, *ibidem*, p. 91, L. writes,

On the 2nd of March last I sent Your Honours a copy of a summary of a certain book, printed in Rome, the Author of which is the very learned Mr. PHILIPPO BONANNI, a Priest of the Society of Jesus, who maintains that little animals can spring from inanimate matter without generation, according to Aristotle's theory.

The Venerable Very Learned Gentleman [ANTONIO MAGLIABECHI] who sent me the printed sheet writes to me that there is no one in Rome who is so anxious to see my observations as Mr. BONANNI. I would say the same with regard to Mr. BONANNI's observations. In the sheet sent to me the following statement was made amongst other things. *Since the author of this book holds to the opinion of the ancients, and in particular of Aristotle, about the generation of shell-fishes, asserting that they are born spontaneously in mud or sandy earth, etc.*

Here it is seen, very noble sirs, how [the opinion of] some of the members of the Royal Society is disputed, who have exerted themselves in studying generation, and the numerous observations made by them as well as myself, and who always found that no creature is produced except by generation. But as for me, I do not bother about this, nor do I doubt but that Mr. BONANNI's theories will dissolve into thin air.

The book by BONANNI is *Observationes circa viventia, quae in rebus non viventibus reperiuntur* (Observations on living creatures, which are found in non-living things) published in Rome, 1691. RABUS discusses these opposing viewpoints in his review of L.'s *Vierde Vervolg der Brieven* (Fourth continuation of the letters), *De Boekzaal van Europe*, May and June 1692, pp. 414-417.

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<i>Letter:</i>	<b>L-249 of May 1695</b>
<i>Written by:</i>	FREDERIK ADRIAAN VAN REEDE.
<i>Manuscript:</i>	This letter is known only by reference in another letter.
<i>Summary:</i>	In this letter, VAN REEDE writes that he is pleased with L.'s observations about the apple-blossom weevil and black flies on apple tree blossoms.
<i>Sources:</i>	Letter 142 [87] L-248 of 22 April 1695 to FREDERIK ADRIAAN VAN REEDE. Letter 144 [89] L-253 of 18 May 1695 to FREDERIK ADRIAAN VAN REEDE.
<i>Remarks:</i>	VAN REEDE, a wealthy landowner and diplomat from Utrecht, seems to have initiated an exchange of letters by sending L. a caterpillar to study sometime before L. sent his first letter to VAN REEDE, Letter 142 [87] L-

248 of 22 April 1695, *Collected Letters*, vol. 10. VAN REEDE replied to that letter with the present letter before L.'s next Letter 144 [89] L-253 of 18 May 1695, *ibidem*, to which VAN REEDE replied with Letter L-257 of June 1695, in this volume.

Over the following year, L. wrote six more letters to VAN REEDE without receiving a reply, mostly about garden pests: the apple-blossom weevil, black flies, caterpillars, and ermine moths. He also wrote about the anatomy, especially the sexual organs, of aphids, lice, and oysters. L. published all of these letters in *Vijfde* and *Sesde Vervolg der Brieven*. These letters also include Letter 161 L-281 of December 1695, *ibidem*, the dedication to *Vijfde Vervolg der Brieven, geschreven aan verscheide Hoge Standspersonen ed Geleerde Lijden* (Fifth continuation of the letters, written to various high-standing persons and learned people).

In that dedication, L. notes his frequent visits to Renswoude, VAN REEDE's estate between Amersfoort and Arnhem, far enough away that he would have to spend the night. These visits might explain why only three letters are known from VAN REEDE to L., the present letter, Letter L-257 of June 1695, and Letter L-299 of 23 August 1696, all in this volume.

Following VAN REEDE's Letter L-299 of 23 August 1696, L. wrote six more letters to VAN REEDE, without a known reply. L.'s letters were about, among other things, plant-lice, black flies, caterpillars, willow-wood, peat, and measuring the fall of water. He also wrote about oysters, shrimp, ling, haddock, roach, and cod, and how scales determine the age of various fish. See Appendix 9, in this volume, for a complete list of the correspondence between VAN REEDE and L.

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<i>Letter:</i>	<b>L-250 of May 1695</b>
<i>Written by:</i>	PIETER RABUS.
<i>Manuscript:</i>	This letter is known only by reference in L.'s reply.
<i>Summary:</i>	RABUS writes a pleasant letter to L., subject and exact date unknown.
<i>Source:</i>	Letter 145 L-254 of 21 May 1695 to PIETER RABUS.
<i>Remarks:</i>	<p>In the source letter, L. writes, "I have been thinking from time to time about your conception, intimated to me in one of your previous letters, as to the shape of the Fish we call <i>Ray</i>.", <i>Collected Letters</i>, vol. 10, p. 255.</p> <p>The only letter prior to 1695 in which L. discusses the ray fish is Letter 67 [35] L-116 of 3 March 1682 to ROBERT HOOKE. The only prior known letter from Rotterdam notary, scholar, and editor RABUS, Letter L-226 of 18 August 1693, published as an unnumbered letter in <i>Collected Letters</i>, vol. 9, does not mention the ray.</p> <p>L. published only one of his letters to RABUS in his own works. Letter 140 [85] L-246 of 30 November 1694, about the eyes, intestines, and eggs of a dragon-fly, another rejection of spontaneous generation, and the impregnation of women, was published in Dutch in <i>Vijfde Vervolg der</i></p>

## ADDITIONAL LETTERS ...

*Brieven* in 1696 and in Latin translation in *Arcana Naturae Detecta* in 1695, reprinted in *Opera Omnia* in 1722.

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<i>Letter:</i>	<b>L-252 of 2 May 1695</b>
<i>Written by:</i>	MAARTEN ETIENNE VAN VELDEN.
<i>Manuscript:</i>	This letter is known only by reference in L.'s reply.
<i>Summary:</i>	VAN VELDEN writes a cover letter accompanying two printed works and a box of flies. The flies emerged from one of the large caterpillars that had invaded VAN VELDEN's home and stuck to the beams, where they died.
<i>Source:</i>	Letter 146 L-255 of 23 May 1695 to MAARTEN ETIENNE VAN VELDEN.
<i>Remarks:</i>	<p>With this letter, VAN VELDEN, a professor at the university in Louvain, initiates an exchange of letters by sending L. two printed works and a box of flies. The two works are not identified.</p> <p>Over the following two years, L. wrote four letters to VAN VELDEN. Letter 146 L-255 of 23 May 1695, <i>Collected Letters</i>, vol. 10, and Letter 148 L-261 of 12 July 1695, <i>idem</i>, vol. 11, discuss flies and caterpillars. Letter 178 L-306 of 26 October 1696, <i>idem</i>, vol. 12, is a cover letter for a copy of <i>Sesde Vervolg der Brieven</i> and Letter 181 L-314 of 12 February 1697, <i>ibidem</i>, is a letter of support for VAN VELDEN's controversial position on COPERNICUS's ideas about the solar system. In addition to the present letter, VAN VELDEN wrote two in return, Letter L-256 of 30 May 1695 and Letter L-313 of 4 February 1697, both in this volume.</p>

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<i>Letter:</i>	<b>L-256 of 30 May 1695</b>
<i>Written by:</i>	MAARTEN ETIENNE VAN VELDEN.
<i>Manuscript:</i>	This letter is known only by reference in L.'s reply.
<i>Summary:</i>	In this letter, VAN VELDEN writes that he is not satisfied with L.'s observations about the impossibility of small flies being generated from big caterpillars in his letter of 23 May.
<i>Source:</i>	Letter 148 L-261 of 12 July 1695 to MAARTEN ETIENNE VAN VELDEN.

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<i>Letter:</i>	<b>L-257 of June 1695</b>
<i>Written by:</i>	FREDERIK ADRIAAN VAN REEDE.
<i>Manuscript:</i>	This letter is known only by reference in L.'s reply.

- Summary:* In this letter, VAN REEDE writes that he is pleased with L.'s further observations about garden pests.
- Source:* Letter 147 [90] L-260 of 10 July 1695 to FREDERIK ADRIAAN VAN REEDE.
- Remarks:* In his letters to VAN REEDE, L. writes about problems with the 30-tree apple orchard in his own garden outside Delft's Waterslootsepoort. Perhaps VAN REEDE was having similar problems with the orchard at his estate, Renswoude.
- The previous letter from VAN REEDE to L. is Letter L-249 of May 1695, in this volume, responding to L.'s Letter 142 [87] L-248 of 22 April 1695, *Collected Letters*, vol. 10, about the apple-blossom weevil, its larvae and their injuriousness, and their metamorphosis. L. responded with Letter 144 [89] L-253 of 18 May 1695, *ibidem*, about the reproduction and anatomy of the apple-blossom weevil as well as about caterpillars, ermine moths and flies. The next and final letter from VAN REEDE is Letter L-299 of 23 August 1696, in this volume.

- Letter:* **L-258 of 21 June 1695**
- Written by:* PIETER RABUS.
- Manuscript:* This letter is known only by reference in L.'s reply.
- Summary:* In this letter, RABUS asks for L.'s comments on a letter he had received about caterpillars that were growing in a woman's ears.
- Source:* Letter 150 L-263 of sometime in late June or early July 1695 to PIETER RABUS.
- Remarks:* In *Collected Letters*, vol. 11, p. 35, this undated letter to RABUS is dated 21 June or July 1695. However, in the text of his reply, Letter 150 L-263, L. clearly states that it was Rotterdam notary, scholar, and editor PIETER RABUS who wrote a letter on "the 21<sup>st</sup> of last month".
- At some point at the end of 1694 or in 1695, RABUS received a letter from Colmar (in Germany, according to RABUS's summary of the letter, but actually in France since the Treaties of Nijmegen in 1679).
- RABUS sent the summary to L. for comment in the present letter on 21 June 1695. L. must have sent his response, the undated Letter 150, *ibidem*, promptly, because RABUS published his summary, titled "Summary of a letter written from Kolmar, containing a rare illness of a woman, who discharged caterpillars from her right ear", followed by L.'s response, in the July and August 1695 issue of *De Boekzaal van Europe*. RABUS's summary is itself summarized by BOUDEWIJN C. DAMSTEEGT, emeritus professor of Dutch philology at Leiden University, in n. 1 to Letter 150 L-263, *Collected Letters*, vol. 11, p. 27.

## ADDITIONAL LETTERS ...

- Letter:* **L-259 of sometime before July 1695**
- Written by:* ANGELUS VAN WIKHUYSEN (A physician from Zeeland).<sup>166</sup>
- Manuscript:* This letter is known only by reference in another letter.
- Summary:* A doctor from Zeeland writes to request L.'s opinion on the origin of flies from a dead caterpillar. He encloses the flies' cocoon, but has lost the caterpillar.
- Sources:* Letter 148 L-261 of 12 July 1695 to MAARTEN ETIENNE VAN VELDEN.
- Remarks:* The "doctor from Zeeland" is most likely ANGELUS DANIELS VAN WIKHUYSEN (1656-1723), who visited L. several times. Most of their correspondence is lost. It is not known whether L. sent the reply mentioned in Letter 148 L-261 of 12 July 1695, *Collected Letters*, vol. 11. VAN WIKHUYSEN is also probably the "certain gentleman" who wrote Letter L-269, a few months before September 1695, in this volume.
- For a later exchange of letters, see L.'s Letter 266 L-449 of July 1707 to VAN WIKHUYSEN, *Collected Letters*, vol. 15, and his reply, Letter L-456 of 15 July 1707, in this volume.

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- Letter:* **L-269 of sometime before September 1695**
- Written by:* ANGELUS VAN WIKHUYSEN (A certain gentleman).
- Manuscript:* This letter is known only by reference in another letter.

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<sup>166</sup> ANGELUS (ENGEL) VAN WIKHUYSEN (or WIJCKHUIJSEN, c. 1656–1723) was born in Middelburg. He registered at Leiden University on 16 September 1676 as "Angelus Daniels, Medioburgensis", stating that he was 20 years old. In June 1678 he registered at the University of Harderwijk as "Angelus Danielides à Wijckhuijsen", to be promoted to physician by professor CORNELIUS VAN ZIJLL on the subject of 'morbi de peste' (diseases of the plague). Back in Leiden, he married CORNELIA VAN WOUW (†1688), daughter of a pharmacist from The Hague, in November of that year. He then signed his name as "Engel Danielsz van Wickhuysen, M.D.", living in Leiden at the Langebrugge. In 1684, when he sold a "Speeltuyn" (play garden) on the "Philosophenpad" outside the Leiden Koepoort, he lived on the Hoge Woerd. In 1686, he moved to Middelburg, where he settled as a physician on the Lange Delft and became a member of the 'Église Wallone'. On 25 July 1707 L. wrote about him in Letter 270 L-457 "I have been acquainted for many years with Mr. ANGELUS VAN WIKHUIJSEN, Doctor of Medicine, living in Middelburg, in Zeeland, whom I esteem very much, because he has frequently said to me (as did also several other learned gentlemen) that he knew very little of medical science, and that usually he produced good results with simple things". In 1716, in the first edition of the *Middelburgsche Naammyzer*, WIKHUYSEN is still mentioned as a practicing physician, then on the Lange Viele. He died in October 1723 and was buried in the Old Church of Middelburg. See for sources: 'Erfgoed Leiden en Omstreken' and website 'Zeeuwen Gezocht'. (Consulted November 2024).

- Summary:* A gentleman writes to inform L. about mussel gatherers and a minister who believe that mussels are formed by spontaneous generation from marine vapours and exhalations and from decaying bodies and how they hang on apple trees.
- Source:* Letter 146 L-255 of 23 May 1695 to MAARTEN ETIENNE VAN VELDEN.
- Remarks:* The “certain gentleman” is probably ANGELUS VAN WIKHUYSEN, who lived in Zeeland and who visited L. several times. Most of their correspondence is lost. VAN WIKHUYSEN is most likely the “doctor from Zeeland” who wrote Letter L-259 of a few months before July 1695, in this volume.
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- Letter:* **L-272 of 12 October 1695**
- Written by:* ANTONIO MAGLIABECHI.
- Manuscript:* No manuscript is known.
- Published in:* A. MAGLIABECHI, 1695: “Italiaansch Boeknieuws”, *De Boekzaal van Europe*, November and December 1695, pp. 538-543. – Dutch translation of part of the original Latin or Italian letter.
- Summary:* In this excerpt from his letter, MAGLIABECHI expresses his thanks to L. for dedicating *Arcana Natura Detecta* to him. He showed L.’s letter of 16 August 1695 to Duke COSIMO III and his sons. MAGLIABECHI adds reports of several recent books that he thought might be of interest to L. written in Latin or Italian by some fellow Italians.
- Remarks:* RABUS regularly published excerpts from MAGLIABECHI’s letters to L. This letter is the third of the fourteen letters with book news published in thirteen *Boekzaal* articles from March 1693 to October 1699.
- MAGLIABECHI’s previous letter to L. is Letter L-238 of before March 1694, in this volume. L. refers to the present letter in Letter 159 L-276 of 31 October 1695 to MAGLIABECHI, *Collected Letters*, vol. 11, p. 119:

Your very welcome Letter of 12 October 1695 was delivered to me on the 28th of this Month by the Rev. Father DANIEL VAN PAPENBROEK of Antwerp. After noting the content of your letter, I was astonished about all the tokens of goodwill contained therein, and also when I learned that my letter to you [of 16 August] was appreciated so greatly by you that you communicated it the next day to the Eminent Duke and the Princes, which I was very pleased to hear. But I must say that my speculations do not deserve even one thousandth part of the appreciation You bestow upon them.

L. refers to this letter again in Letter 162 L-282 of 22 December 1695 to MAGLIABECHI, *ibidem*, p. 155. MAGLIABECHI’s next letter to L. is Letter L-273 of two days later, 14 October 1695, in this volume.

## ADDITIONAL LETTERS ...

*Content:* English translation of the first part of the printed text in De Boekzaal under the heading “Chapter XVIII Italian Book News, drawn from the letter of the famous Mr. ANTONIO MAGLIABECHI, librarian of his Regal Serenity, the Grand Duke of Tuscany<sup>167</sup>, written to Mr. ANTONI VAN LEEUWENHOEK from Florence.”

Sir, I just received Your Honour’s very kind and polite letter, also with the first printed page of the book that Your Honour truly with an abundance of goodness and kindness graciously dedicated to me<sup>168</sup>. I assure you that my eyes hardly believed the sight of such a great honour, almost being doubtful if I understood it correctly. To tell the truth, when did I ever deserve that the very famous Mr. LEEUWENHOEK would deem me worthy for one of his so glorious and much-praised works? It’s true, I have had the highest esteem for you, but never the good fortune to serve you in any matter, even in the least. So is your goodness and kindness the greater, etc. value, for I with the pen, and even more with the heart, say the greatest thanks to you that I know and can; the honour being so great that, knowing it not deserved by me, I would not have dared, not even with thoughts, to harbor ambition for it.

Tomorrow I will show your letter, as well as the printed page, not only to the illustrious grand prince, my lord, but also to all of the serene princes<sup>169</sup> who are here, because the honour that you have pleased to grant to me, redounds to the glory of the whole court.

Your Honour’s letter will be more pleasant to the above-mentioned princes, for so much is mentioned in it that in the last week the Serene Palatine Electoress<sup>170</sup> has been in your renowned studio<sup>171</sup>. I will, by the occasion of the ship which comes from Livorno, expect some prints of the book to offer myself to the serene princes. My request is that on top of the pack of the printed copy, please write my name, and seal it yourself, so that it is safe to come, and straightforward, to the recommendation of the consul at Livorno<sup>172</sup>.

*The letter is signed:*

all of the highest obligation, etc.

ANTONIO MAGLIABECHI.

Florence, the 12<sup>th</sup> of the Wine month<sup>173</sup> 1695.

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<sup>167</sup> COSIMO III DE’ MEDICI (1642-1723) was the grand duke of Tuscany from 1670 to 1723. In the late 1660s, he twice traveled to the Dutch Republic, where he visited CONSTANTIJN HUYGENS, NICOLAES HEINSIUS, ISAAC VOSSIUS, JACOBUS GRONOVIVS, GEORGIUS GRAEVIUS, FREDERIK RUYSCH, and JOHANNES SWAMMERDAM.

<sup>168</sup> *Arcana Natura Detecta*, published in Delft by HENRIK KROONEVELD in 1695. The dedication is Letter 152 L-265, *Collected Letters*, vol. 11.

<sup>169</sup> COSIMO III had a daughter, ANNA MARIA, and two sons, FERDINANDO (1663-1713) and GIAN GASTONE (1671-1737), who succeeded his father.

<sup>170</sup> ANNA MARIA LUISA DE’ MEDICI (1667-1743) was the daughter of COSIMO III and the second wife of JOHANN WILHELM II, Elector Palatine. Along with her husband and mother-in-law, ANNA MARIA visited L. in August 1695.

<sup>171</sup> In Dutch *konstvertrek*, literally, ‘art room’ or display chamber.

<sup>172</sup> L. must have received this letter quickly because by the end of the month, he followed MAGLIABECHI’s instructions. Livorno was the major port along the Tuscan coast, a duty-free port that attracted merchants from all over the world. The consul managed trade between the Dutch Republic and the Republic of Florence. At the time, JACOB CALCKBERNER was the consul. See L.’s letter to CALCKBERNER, Letter L-277 of 31 October 1695, in this volume.



Mr. HENRIK KOPES<sup>174</sup>, council member in 's Hertogenbosch, truly a very learned and polite gentleman, was detained here for a few days. He has, making me ashamed, presented me with the new printing of FRANCOIS JUNIUS's work about the painting art of the ancients<sup>175</sup>, and left last week for Rome.

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<i>Letter:</i>	<b>L-273 of 14 October 1695</b>
<i>Written by:</i>	ANTONIO MAGLIABECHI.
<i>Manuscript:</i>	This letter is known only by reference in L.'s reply.
<i>Summary:</i>	In this letter, delivered to L. by the Jesuit priest DANIEL PAPENBROEK, MAGLIABECHI praises L. and his work upon learning that L. has dedicated <i>Arcana Natura Detecta</i> to him.
<i>Source:</i>	Letter 162 L-282 of 22 December 1695 to ANTONIO MAGLIABECHI.
<i>Remarks:</i>	<p>This letter was written two days after MAGLIABECHI's previous letter to L., Letter L-272 of 12 October 1695, probably upon receipt of the news that L. had dedicated <i>Arcana Natura Detecta</i> to him. His next letter was written later that month, Letter L-275 of 23 October 1695. Both letters are in this volume and both contain book news that was published in <i>De Boekzaal van Europe</i>.</p> <p>The exchange of letters between MAGLIABECHI and L. also involves two others, JACOBUS GRONOVIVS, a professor of history and Greek from Leiden and DANIEL PAPENBROEK, a Jesuit priest from Antwerp. GRONOVIVS knew MAGLIABECHI personally from his years in Italy before he became a professor in Leiden. He may well have been instrumental in initiating the contact between L. and MAGLIABECHI. PAPENBROEK, passed letters and books between MAGLIABECHI and L.</p>

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<sup>173</sup> RABUS wrote *Wijnmaand*, the old Dutch word for October.

<sup>174</sup> HENDRIK KOPES (-1708) was a geographer and anthropologist from 's Hertogenbosch. He studied the Texandri, a Germanic people living during the first century C.E. between the Scheldt and Rhine rivers. See VAN DER AA, *Biog. Woordenboek der Nederlanden*, vol. III, pp. 705-706.

<sup>175</sup> FRANCISCUS JUNIUS (1591-1677) was a philologist who was born in Germany and educated in the Dutch Republic, where he lived for the rest of his life. The new printing that MAGLIABECHI refers to here is the 1694 enlarged second edition of *De pictura veterum*, originally published in 1637, translated into Dutch in 1641 as *De Schilder-konst der Oude* (The painting art of the ancients), and reprinted in 1659. It was the first comprehensive overview of ancient writings on the visual arts.

## ADDITIONAL LETTERS ...

<i>Letter:</i>	<b>L-275 of 23 October 1695</b>
<i>Written by:</i>	ANTONIO MAGLIABECHI.
<i>Manuscript:</i>	No manuscript is known.
<i>Published in:</i>	A. MAGLIABECHI, 1696: "Italiaansch Boeknieuws", <i>De Boekzaal van Europe</i> , March and April 1696, pp. 374-378. – Dutch translation of the original Latin and Italian.
<i>Summary:</i>	In this excerpt from his letter, MAGLIABECHI reports on several recent books that he thought might be of interest to L., all written in Latin or Italian by fellow Italians.
<i>Remarks:</i>	Rabus regularly published excerpts from MAGLIABECHI's letters to L. This letter is the fourth of the fourteen letters with book news published in thirteen <i>Boekzaal</i> articles from March 1693 to October 1699. L. does not refer to this letter in any of his own letters.

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<i>Letter:</i>	<b>L-277 of 31 October 1695</b>
<i>Addressed to:</i>	JACOB CALCKBERNER.
<i>Written by:</i>	ANTONI VAN LEEUWENHOEK.
<i>Manuscript:</i>	This letter is known only by reference in another letter.
<i>Summary:</i>	In this letter, L. requests that the Netherlands' counsel in Livorno, JACOB CALCKBERNER, forward a package with two copies of <i>Arcana Natura Detecta</i> to ANTONIO MAGLIABECHI, to whom the book is dedicated.
<i>Source:</i>	Letter 162 L-282 of 22 December 1695 to ANTONIO MAGLIABECHI.
<i>Remarks:</i>	In the source letter, <i>Collected Letters</i> , vol. 11, p. 155, Leeuwenhoek writes,

On the same day I dispatched a parcel to Rotterdam, in order that it might be transported thence by sea to Livorno. This parcel I sealed carefully and marked with the letters A.M., and I added a letter, marked in the same way and addressed to the Very Noble Consul of the Netherlands, in which I urgently requested the Very Noble Consul to deliver to you those books along with the enclosed letter.

This letter is the only known correspondence between L. and JACOB CALCKBERNER (1643-1706; also, GIACOMO), a Dutch businessman who was consul for the Dutch Republic in Livorno from 1680 until his death. He is not to be confused with HANS JAKOB KALKBRENNER, born in 1624 in Aachen, Rheinland, who was the Dutch consul in

Aleppo during the same years<sup>176</sup>.

By “the same day”, L. means 31 October 1695, when L. sent a package with the same books to ANTONIO MAGLIABECHI via Baron BETTINO ANTONIO RICASOLI (1652-1734). See Letter 159 L-276 of 31 October 1695, *Collected Letters*, vol. 11.

RICASOLI took them as far as Dusseldorf. In a letter two weeks later on 15 November 1695 from duke COSIMO III's secretary APOLLONIO BASSETTI to COSIMO's librarian MAGLIABECHI, BASSETTI writes,

Mr. Baron RICASOLI writes to me from the Palatinate, while passing by on the way to Vienna, the following postscript:

P.S. A certain LEUWENEHEK from Delft, observer with the microscope, gave me a package of his books for Mr. MAGLIABECHI, with the attached letter, which I ask you [BASSETTI] to have them delivered, and he tells him to deliver the package of books to a certain Doctor FROSINI<sup>177</sup> on his return to Düsseldorf, so that he can send it to him [MAGLIABECHI] at the earliest possible time. (Biblioteca Nazionale Centrale di Firenze, Magl. VIII 425, f. 44).

For the package via Livorno, L. followed the instructions in Letter L-272 of 12 October 1695, in this volume, where MAGLIABECHI writes, “I will, by the occasion of the ship which comes from Livorno, expect some prints of the book to offer myself to the serene princes. My request is that on top of the pack of the printed copy, please write my name, and seal it yourself, so that it is safe to come, and straightforward, to the recommendation of the consul at Livorno.”

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<i>Letter:</i>	<b>L-278 of sometime before November 1695</b>
<i>Written by:</i>	His Excellency Mr ...
<i>Manuscript:</i>	This letter is known only by reference in another letter.
<i>Summary:</i>	In this letter, someone from Düsseldorf writes to L.
<i>Source:</i>	Letter 160 [96] L-279 of 9 November 1695 to JOHANN WILHELM VON PFALZ-NEUBURG.
<i>Remarks:</i>	L. begins his letter to JOHANN WILHELM, who lived in Düsseldorf, with a reference to someone they know in common, but without context or details. It is possible that “His Excellency Mr ...” is LUCA GIAMBERTI. However, it was not until over a year later that the exchange of letters began between L. and GIAMBERTI and that L. began to make references to GIAMBERTI in his correspondence with ANTONIO MAGLIABECHI and

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<sup>176</sup> See BOWDLER & DER WEDUWEN, “The ambassador and the press”.

<sup>177</sup> FRANCESCO FROSINI (1654-1733) was an Italian Catholic archbishop.

## ADDITIONAL LETTERS ...

JOHAN ARNOLDI. Another possibility is FRANCESCO FROSINI (1654-1733), an Italian Catholic archbishop. See the Remarks to Letter L-277 of 31 October 1695, in this volume.

See Letter L-325 of 19 July 1697 from GIAMBERTI and the Remarks to Letter L-333 of 15 January 1698 from ARNOLDI, both in this volume, as well as L.'s Letter 186 L-324 of June or July 1697 to GIAMBERTI, *Collected Letters*, vol. 12.

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<i>Letter:</i>	<b>L-280 of 5 November 1695</b>
<i>Written by:</i>	ANTONIO MAGLIABECHI.
<i>Manuscript:</i>	This letter is known only by reference in L.'s reply.
<i>Summary:</i>	In this letter, delivered by JACOBUS GRONOVIVS, MAGLIABECHI praises L. for his work.
<i>Source:</i>	Letter 162 L-282 of 22 December 1695 to ANTONIO MAGLIABECHI.
<i>Remarks:</i>	This letter is one of the few letters that MAGLIABECHI sent to L. that did not contain news about recently published books. It is the final letter in a series of four letters sent over a period of three weeks, beginning with Letter L-272 of 12 October 1695. L. replied to the present letter with Letter 162 L-282 of 22 December 1695, <i>Collected Letters</i> , vol. 11. MAGLIABECHI's previous letter is Letter L-275 of 23 October 1695 and his next letter is Letter L-286 of 6 March 1696. All three letters from MAGLIABECHI are in this volume. DANIËL PAPENBROEK (1628-1714) and JACOBUS GRONOVIVS (1645-1716) forwarded letters from MAGLIABECHI to L. several times. See the Remarks to Letter L-273 of 14 October 1695, in this volume.

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<i>Letter:</i>	<b>L-284 of 17 February 1696</b>
<i>Written by:</i>	HANS SLOANE (for the Royal Society).
<i>Manuscript:</i>	This letter is known only by reference in another letter.
<i>Summary:</i>	Someone from the Royal Society writes a courteous and encouraging letter to L. that includes a reference to a letter that L. never received.
<i>Source:</i>	Letter 169 [102] L-295 of 10 July 1696 to the Royal Society.
<i>Remarks:</i>	Through 1694, RICHARD WALLER was the Royal Society secretary assigned to correspond with L. Beginning with Letter L-311 of 18 December 1696, HANS SLOANE, elected second secretary of the Society in November 1693, assumed that responsibility. Thus, the present letter was probably written by him. If so, it is the beginning of their exchange of letters.

In the source Letter 169 [102] L-295, L.'s reference to "another Letter to me a few months ago" and, at the end of the letter, to "Your very welcome letters" perhaps indicates another lost letter because the previous known letter from someone at the Royal Society to L. was sent two years earlier, Letter L-243 of 2 May 1694, *Collected Letters*, vol. 10, p. 86, there unnumbered and dated 22 April 1694 O.S., from RICHARD WALLER.

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<i>Letter:</i>	<b>L-286 of 6 March 1696</b>
<i>Written by:</i>	ANTONIO MAGLIABECHI.
<i>Manuscript:</i>	This letter is known only by reference in another letter.
<i>Summary:</i>	In this letter, MAGLIABECHI tells L. that he has finally received the books that L. had sent to him and that he will present one copy to "the most serene duke".
<i>Source:</i>	Letter 173 L-301 of 28 August 1696 to ANTONIO MAGLIABECHI.
<i>Remarks:</i>	The notes to Letter 173 L-301 in <i>Collected Letters</i> , vol. 12, explain that the books referred to here are two complimentary copies of <i>Arcana Naturae Detecta</i> ., which L. dedicated to MAGLIABECHI. See Letter 153 L-266 of 16 August 1695, <i>idem</i> , vol. 11. Letter 158 L-274 of 18 October 1695, <i>ibidem</i> , is the cover letter that accompanied the books, entrusted to Baron BETTINO RICASOLI (1652-1734). In Letter 159 L-276 of 31 October 1695 to MAGLIABECHI, <i>ibidem</i> , L. notes that "to be on the safe side", he has sent two additional copies via ship from Rotterdam to Livorno, the seaport closest to MAGLIABECHI's home in Florence. See Letter L-277 of 31 October 1695 to JACOB CALCKBERNER, in this volume. In Letter 162 L-282 of 22 December 1695, <i>ibidem</i> , L. mentions these books again. The "serene duke" is COSIMO III DE' MEDICI.

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<i>Letter:</i>	<b>L-290 of 5 June 1696</b>
<i>Written by:</i>	ANTONIO MAGLIABECHI.
<i>Manuscript:</i>	No manuscript is known.
<i>Published in:</i>	A. MAGLIABECHI, 1696: "Nieuws", <i>De Boekzaal van Europe</i> , September and October 1696, pp. 363-365. – Dutch translation of the original Latin and Italian.
<i>Summary:</i>	In these excerpts from two of his letters, MAGLIABECHI tells L. that his work is now in the library of the duke and other prominent people. He also reports on several recent books that he thought might be of interest to L. written in Latin by fellow Italians. The other letter is Letter L-293 of 8 July 1696, in this volume.

## ADDITIONAL LETTERS ...

*Remarks:* RABUS regularly published excerpts from MAGLIABECHI's letters to L. This letter is the fifth of the fourteen letters with book news published in thirteen *Boekzual* articles from March 1693 to October 1699. It was excerpted in the same *Boekzual* article as Letter L-293 of 8 July 1696, in this volume.

L. refers to these two letters from MAGLIABECHI in one of his published letters, revealing parts of the letters that RABUS did not include in the *Boekzual*. In Letter 175 L-303 of 7 September 1696 to ANTONIO MAGLIABECHI, *Collected Letters*, vol. 12, L. writes,

After that time I received Your most kind letter of the 5<sup>th</sup> of June, which the Very Famous GRONOVIVS, when travelling through Our City, sent to me through the intermediary of someone else, since he himself had no time to visit my house. And it is just because this letter came so late into my hands that I have not been able to reply to it sooner.

In both these letters, Illustrious Sir, you lavish such honourable designations on me and you extol so greatly both the dedication of my book to Your Illustrious Name and the matters contained therein that I remember them not without shyness, because I do not even merit a thousandth part of the things which you do not disdain to say about me and my work.

Indeed, I consider that I have acquired enough and more than enough Fame if my modest work is somewhat appreciated by the Learned, and even much more so if my work seems to be worthy of being given a place in the well-furnished Library of the Most Serene Duke and of the Most Eminent Prince and Cardinal, which I learn from your letter has taken place.<sup>178</sup>

Meanwhile I humbly beg you, if in future you should send me a letter, to refrain from extolling me with so many names and titles and only to write to me as to a citizen of modest birth, whom these titles do not fit at all, and thus You will oblige me very much."

MAGLIABECHI's previous letter to L. is Letter L-286 of 6 March 1696, in this volume.

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*Letter:* **L-291 of sometime before July 1696**

*Written by:* NICOLAAS WITSEN.

*Manuscript:* This letter is known only by reference in L.'s reply.

*Summary:* With this letter, WITSEN encloses a mineral from eastern Asia and a map that WITSEN, also a cartographer, made himself so that L. can find the geographic source of the mineral. He also sends L. a copy of a letter he has received from the East Indies about little animals producing honey at the village of Ergam on the southeastern coast of India.

*Source:* Letter 167 [100] L-292 of 6 July 1696 to NICOLAAS WITSEN.

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<sup>178</sup> Duke COSIMO III DE' MEDICI (1642-1723) and his brother, the prince and cardinal FRANCESCO MARIA (1660-1711). See the Biogr. Reg., *Collected Letters*, vol. 11, p. 339.

- Remarks:* L. initiates this brief exchange of letters with WITSEN with Letter 165 [99] L-287 of 8 March 1696, *Collected Letters*, vol. 11. In it, L. discusses the vermin that infested the stores of spices that the Dutch East India Company had brought back from the East Indies. As a director (*bevindhebber*) of the Amsterdam chamber of the Company and one of the mayors of Amsterdam, WITSEN had a special interest in L.'s solution of painting the warehouses with a red paint that the worms could not penetrate. WITSEN replied with the present letter, to which L. responded with Letter 167 [100] L-292 of 6 July 1696, reporting the results of his analysis of the mineral that WITSEN had sent to him. L.'s final letter to WITSEN was written four days later, Letter 168 [101] L-294 of 10 July 1696, explaining his demonstration of the then-disputed theory that Earth rotates around its axis. Both letters are found in *ibidem*. It is not known whether WITSEN replied to either of these letters. For NICOLAAS WITSEN (1641-1717), see GEBHARD, *Het Leven van Mr. Nicolaas Cornelisz. Witsen*.
- Shortly thereafter, L. corresponded with MAARTEN ETIENNE VAN VELDEN on the same topic in Letter 178 L-306 of 26 October 1696 and Letter 181 L-314 of 12 February 1697, both in *idem*, vol. 12.

- Letter:* **L-293 of 8 July 1696**
- Written by:* ANTONIO MAGLIABECHI.
- Manuscript:* This letter is known only by reference in another letter.
- Published in:* A. MAGLIABECHI, 1696: "Nieuws", *De Boekzaal van Europe*, September and October 1696, pp. 363-365. – Dutch translation of the original Latin and Italian.
- Summary:* In these excerpts from two of his letters, MAGLIABECHI reports on several recent books that he thought might be of interest to L. written in Latin by some fellow Italians.
- Remarks:* RABUS regularly published excerpts from MAGLIABECHI's letters to L. This letter is the sixth of the fourteen letters with book news published in thirteen *Boekzaal* articles from March 1693 to October 1699. It was excerpted in the same *Boekzaal* article as Letter L-290 of 5 June 1696, in this volume. See that letter for the text in the *Boekzaal*.
- L. refers to this letter from MAGLIABECHI in two of his published letters, revealing parts of the letter that PIETER RABUS did not include in the *Boekzaal*. In Letter 173 L-301 of 28 August 1696 to ANTONIO MAGLIABECHI, *Collected Letters*, vol. 12, L. writes,
- A few days ago, I received Your very kind and welcome Letter of the 8<sup>th</sup> of July and also the pages printed at Modena; through this generous communication you will always find me indebted and most grateful to Your Illustrious Name.
- From this later letter of yours I learned, *inter alia*, that you had already notified me before in a letter that the said packet of books, sent by me to

## ADDITIONAL LETTERS ...

Leghorn [Livorno] to the Most Excellent Gentleman, had already been received by you.

Ten days later, in Letter 175 L-303 of 7 September 1696 to ANTONIO MAGLIABECHI, *ibidem*, L. writes,

I received at the due and proper time Your very welcome Letter of the 8<sup>th</sup> of July, Illustrious Sir, through the intermediary of the Reverend Father DANIEL VAN PAPENBROEK: since, however, at that time I was about to start on a journey to another region, this was the reason why I did not reply to it before the 28<sup>th</sup> of August.

The “pages printed at Modena” may be an excerpt from one of BERNARDINO RAMAZZINI’s publications mentioned in MAGLIABECHI’s Letter L-209 of 27 May 1691, Letter L-219 of 24 June 1692, Letter L-275 of 23 October 1695, or Letter L-290 of 5 June 1696, all in this volume.

The “Most Excellent Gentleman” in Livorno is Dutch consul JACOB CALCKBERNER. See L.’s letter to him, Letter L-277 of 31 October 1695, in this volume.

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<i>Letter:</i>	<b>L-299 of 23 August 1696</b>
<i>Written by:</i>	FREDERIK ADRIAAN VAN REEDE.
<i>Manuscript:</i>	This letter is known only by reference in L.’s reply.
<i>Summary:</i>	In this letter, VAN REEDE writes to L. about unspecified topics.
<i>Source:</i>	Letter 172 [104] L-300 of 26 August 1696 to FREDERIK ADRIAAN VAN REEDE.
<i>Remarks:</i>	<p>The previous letter from VAN REEDE to L. is Letter L-257 of June 1695, in this volume. L. replied with six letters, all in <i>Collected Letters</i>, vols. 10, 11, and 12, one of which, Letter 161 L-281 of December 1695, is the dedication to L.’s <i>Vijfde Vervolg der Brieven</i>.</p> <p>The present letter is the last known letter from VAN REEDE to L., who would write five more to VAN REEDE, all in <i>Collected Letters</i>, vols. 12, 13, and 14, before his final Letter [XLII] L-558 of 10 September 1717, <i>idem</i>, vol. 18.</p>

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<i>Letter:</i>	<b>L-310 of 18 December 1696</b>
<i>Written by:</i>	ANTONIO MAGLIABECHI.
<i>Manuscript:</i>	No manuscript is known.



*Published in:* A. MAGLIABECHI, 1697: “Italiaansch Boeknieuws”, *De Boekzaal van Europe*, January and February 1697, pp. 183-186. – Dutch translation of the original Latin and Italian.

*Summary:* In this excerpt from his letter, MAGLIABECHI reports on several recent books that he thought might be of interest to L. written in Latin by some fellow Italians. PIETER RABUS ends the article by noting a letter from HERMAN LUFNEU to be published in an upcoming issue of *De Boekzaal*.

*Remarks:* RABUS regularly published excerpts from MAGLIABECHI’s letters to L. This letter is the seventh of the eleven letters with book news published in ten *Boekzaal* articles from March 1693 to October 1699.

In one of his published letters, L. refers to this letter from MAGLIABECHI and reveals parts of the letter that PIETER RABUS had not included in the *Boekzaal*. In Letter 185 L-323 of 6 June 1697 to MAGLIABECHI, *Collected Letters*, vol. 12, L. writes,

Recently I received your very welcome letter, with the printed letter addressed to You by the excellent Medical Doctor SCARAMUCCI, which letter speaks, inter alia, about the petrified skeleton of an elephant, found in Saxony.

However this may be, I agree with those who believe that neither bones, nor shells, nor fishes are formed under ground, but that the earth has been subject to many mutations, as a result of which mountains and whole Regions have been converted into sea and conversely high Mountains have arisen from the sea, and thus we do not have to wonder that the bowels of mountains, viz. fishes, shells, etc., have been converted into stones.

MAGLIABECHI’s previous letter to L. is Letter L-293 of 8 July 1696, in this volume. L. replied with Letter 173 L-301 of 28 August 1696 and Letter 175 L-303 of 7 September 1696, both in *idem*, vol. 12. MAGLIABECHI’s next letter to L. is Letter L-322 of 1 June 1697, in this volume.

*Letter:* **L-311 of 18 December 1696**

*Written by:* HANS SLOANE.

*Manuscript:* This letter is known only by reference in other letters.

*Summary:* In this letter, SLOANE writes to L. that the Royal Society has charged him to return to L. the members’ courtesies.

*Sources:* Letter 182 L-315 of 19 February 1697 to HANS SLOANE.

Letter 184 [108] L-318 of 5 April 1697 to the Royal Society.

*Remarks:* If not Letter L-284 of 17 February 1696, in this volume, from someone at the Royal Society, probably HANS SLOANE (1659-1738, then the present

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letter begins the exchange of letters between L. and SLOANE. He was elected on 30 November 1693 to replace THOMAS GALE as first secretary of the Royal Society. SLOANE worked at first with ROBERT WALLER and others on volume 18 of *Philosophical Transactions*. From volume 19 on, SLOANE took sole editorial responsibility. He published 69 letters by L. over the following 20 years in volumes 19 through 28, more than half of all of the letters by L. published there.

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<i>Letter:</i>	<b>L-312 undated (around 1697)</b>
<i>Written by:</i>	GOTTFRIED WILHELM LEIBNIZ.
<i>Manuscript:</i>	No manuscript is known. A copy in French in the hand of CHRISTOPH GOTTLIEB VON MURR <sup>179</sup> is to be found in the Staatsbibliothek in Berlin, Ms. lat. Fol. 311 B Bl. 46-47, 1 quarto page.
<i>Published in:</i>	L. DUTENS, 1768: <i>Gothofredi Guillelmi Leibnitii Opera Omnia</i> , vol. 2, pp. 92-94 (Geneva: Apud Fratres de Tournes) – French text with the title “Sur l’Aimant” (On the magnet). RENATE ESSI & MALTE-LUDOLF BABIN (eds.), <i>Transkriptionen des Leibniz-Briefwechsels 1716 für die Leibniz-Akademie-Ausgabe (überprüft). Version 1.</i> (Hannover: Leibniz-Forschungsstelle der Akademie der Wissenschaften zu Göttingen / Niedersächsische Landesbibliothek, 2020), no. 853 (with estimated date ‘1716’).
<i>Summary:</i>	In this undated letter, LEIBNIZ replies to L.’s observations about magnets and offers his speculations about magnets and the magnetic power of the Earth.
<i>Remarks:</i>	The text of this partial letter from LEIBNIZ to L. is probably a French translation of a now missing draft letter by LEIBNIZ, sent by him as an enclosure with one of his letters to LOUIS BOURGUET (1678-1742), a French polymath living in Neuchâtel, who wrote on archaeology, geology, philosophy, biblical scholarship, and mathematics. BOURGUET’s correspondence with LEIBNIZ, published in 1768, contains letters exchanged between December 1714 and 2 July 1716. These letters were provided to LOUIS DUTENS (1730-1812), the 18 <sup>th</sup> -century editor of LEIBNIZ’s correspondence, by CLAUDE-NICOLAS LE CAT (1700-1768), “Secrétaire perpétuel” of the Académie de Rouen, through the mediation of NICOLAS GOBET (c. 1735-c. 1781), a French historian and mineralogist and “Secrétaire du conseil du comte d’Artois”. See: DUTENS, <i>Leibnitii Opera Omnia</i> , vol. 2 (Geneva, 1768), p. 324 (note). Even though LEIBNIZ visited L. in 1676, the surviving exchange of letters between them occurred in the final two years of LEIBNIZ’s life, 1715 and 1716. They are Letter 319 L-523 of 18 November 1715, Letter

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<sup>179</sup> CHRISTOPH GOTTLIEB VON MURR (1733 –1811) was a polymathic German scholar, based in Nuremberg.

320 [XIX] L-524 of 18 November 1715, and Letter 322 [XX] L-527 of 13 March 1716, before LEIBNIZ wrote Letter 323 L-528 of 31 March 1716 about membranes, multiple births, and reproduction. These four letters are all found in *Collected Letters*, vol. 17.

L. replied in Letter 326 L-532 of 19 May 1716, *ibidem*, which was followed by LEIBNIZ's final letter to L., Letter L-539 of 26 September 1716, *idem*, vol. 18. L.'s reply, Letter L-545 [XXX] of 17 November 1716, *ibidem*, was dated three days after LEIBNIZ's death.

In those letters, magnets are never mentioned. It is then possible that this undated letter fragment is part of a lost exchange of letters from 1697 because *Philosophical Transactions*, vol. 19, no. 227, published in April 1697, has L.'s Letter 184 [108] L-318 of 5 April 1697 (*Collected Letters*, vol. 12), in which he discusses some of the topics LEIBNIZ writes about in this fragment.

LEIBNIZ's reading of L.'s Letter 184 [108] L-318 of 5 April 1697 in *Philosophical Transactions* no. 227 of the same month or the excerpt in PIETER RABUS's *De Boekzaal van Europe* of May and June 1697 could have caused him to write to L. later that year. He begins by thanking L. for his "reply", which suggests a prior letter from LEIBNIZ as well as a reply from L.

BECCHI's "Leibniz, Leeuwenhoek and the School for Microscopists" discusses only the five letters to LEIBNIZ that L. published in *Send-Brieven* and the five letters from LEIBNIZ that are in *Collected Letters*, vol. 17 and vol. 18.

*Text:*

Lettre de M<sup>R</sup>. LEIBNIZ à M<sup>R</sup>. LEUWENHOEK sur l'Aimant.

Note: Cet lettre est une de celles qui m'ont été communiquées par M. GOBET.

Je suis bien aise, Monsieur, d'apprendre par l'honneur de votre réponse, que selon des expériences exactes que vous avez faites, la vertu attractive de l'aimant n'est point diminuée lorsqu'il se trouve dans une situation contraire à celle où il est disposé de se mettre naturellement. Cependant vous m'obligeriez, en me donnant plus d'instruction là-dessus. Votre expérience de la limaille de fer, laquelle s'étant rangée selon la situation de l'aimant, garde cet arrangement quoiqu'on la tourne toute avec l'aimant, est ingénieuse et digne de vous. Mais quoiqu'il ne se remarque point une différence sensible dans cet arrangement, lorsqu'il y a un changement de situation, il ne s'ensuit point que l'action attractive de l'aimant ne puisse être assez combattue, pour que quelques autres effets qu'elle a, soient diminués sensiblement; parce qu'il se peut que l'effet de cette petite diminution ne puisse pas se faire assez remarquer dans la limaille, qui consiste en parcelles petites et courtes, & qui ont de la friction contre le fond, & les unes contre les autres, & qui se sont déjà liées. Il faudroit une force notable pour les obliger à se placer autrement, & il faudroit une grande diminution de la force de l'aimant pour faire cesser la liaison; & un aimant un peu moins fort de foi, mais d'ailleurs semblable en tout à celui qu'on a employé, auroit pû leur donner le même arrangement. Ainsi la durée de cet arrangement ne prouve point la durée de la force. Mais si l'aimant tiroit ou remuoit également une aiguille égale & semblable à une même distance, soit que la situation de l'aimant fût naturelle ou contrainte, on seroit plus assuré du fait; & on pourroit assurer que la différence n'est point sensible; parce qu'il n'y a point de moyen plus

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propre à rendre sensible le degré de la force attractive de l'aimant, que de le faire agir sur une aiguille; il paroît même, Monsieur, que vous avez déjà fait autrefois des expériences approchantes, et c'est ce que je souhaiterois d'apprendre.

Vous dites, Monsieur, que le courant de la matière magnétique de la terre est très foible; mais on y pourra objecter qu'il peut être en quelques rencontres plus fort que l'aimant; par exemple, supposons qu'une aiguille aimantée soit sollicitée par deux forces opposées, l'une de la verticité, l'autre de l'attraction; la première venant du magnetisme de la terre, qui tâche de tourner une des extrémités de l'aiguille vers le Nord; l'autre venant du magnetisme de l'aimant qui tâche de l'attirer et de la tourner vers lui; en ce cas il peut arriver que la verticité soit plus forte que l'attraction, car l'aimant pourra être placé à une telle distance, qu'il seroit capable de tourner l'aiguille si elle n'étoit point aimantée, & n'avoit point d'inclination de se tourner vers le Nord; mais qu'il ne soit point capable de surmonter la propre inclination de l'aiguille.

Cependant je m'avise d'une réponse à cette objection, que je soumets à vôtre jugement: qui est, que l'aiguille aimantée n'est point tournée au Nord par la force magnétique de la terre, mais par celle qu'elle a reçue de l'aimant. Ainsi supposé que ces actions viennent de certains courans de matière magnétique, cette aiguille aura son propre courant, quoique moins fort, comparable pourtant sensiblement avec celui de l'aimant.

Ainsi le moyen d'apprendre si la force magnétique du globe de la terre peut avoir sur le champ une efficace sensible sur l'aimant, est justement la recherche que j'ai proposé pour être examinée; savoir, si le changement de la situation s'oppose sensiblement à l'action de l'aimant. Je dis sur le champ, car à la longue il me semble que les expériences qu'on a faites apprennent qu'une certaine situation de longue durée peut affoiblir, & même détruire à la fin la verticité d'une aiguille aimantée; et en donner à un fer qui n'en a point. Je dis d'une aiguille, car peut-être en est-il autrement de l'aimant, & peut-être qu'il retiendrait sa première verticité, & encore plus sa force attractive, quand même il demeureroit longtems dans une situation contrainte.

J'ai pris la liberté de m'étendre, pour vous donner occasion, Monsieur, de m'éclairer sur cette matière, ce que vous pouvez mieux que personne.

### *English Translation:*

Letter of MR. LEIBNIZ to MR. LEUWENHOEK on the Magnet.

Note: This letter is one of those communicated to me by M. GOBET.

I am glad, sir, to learn by the honour of your reply<sup>180</sup>, that according to the exact experiments that you have made, the attractive virtue of the magnet is not diminished when it finds itself in a situation contrary to the one where it is naturally disposed to place itself<sup>181</sup>. Yet you would oblige me, by giving me more instruction on this. Your experience of the iron filings, which, having been arranged according to the position of the magnet, have kept this arrangement, although it is all turned with the magnet, is ingenious and worthy of you. But even if there is no noticeable difference in this arrangement, when a change of position takes place, it does not mean that the attractive action of the magnet cannot be sufficiently counteracted, so that some of the other effects it has are considerably reduced. Because it

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<sup>180</sup> L.'s letter to LEIBNIZ previous to this letter is unclear. In none of his surviving letters to L. does he mention magnets or loadstones, so perhaps LEIBNIZ refers to a lost letter.

<sup>181</sup> Letter 184 [108] L-318 of 5 April 1697, *Collected Letters*, vol. 12. L. wrote to the Royal Society about the behaviour of magnets in glass tubes and the influence of iron on magnets under various conditions.

may be that the effect of this small reduction cannot be sufficiently noticed, because the small and short pieces of which the filings consist are already bonded together by the friction against the bottom and among themselves. It would take significant force to force them to reposition themselves, and it would take a great reduction in the force of the magnet to break the connection. And a magnet that would be slightly less strong, but moreover comparable in every respect to the one we used, could have produced the same setup. The duration of this arrangement therefore does not prove the duration of the force. But if the magnet also pulled or moved a similar needle the same distance, regardless of whether the magnet's situation was natural or constrained, we would be more certain of the fact. And we may be sure that the difference is imperceptible, because there is no means better suited to making perceptible the degree of the attraction of the magnet, than to make it act upon a needle. In fact, it seems, Sir, that you already have had similar experiences in the past, and this is what I would like to learn<sup>182</sup>.

You say, Sir, that the current of the earth's magnetic matter is very feeble; but it might be objected that in some cases it may be stronger than the magnet. Suppose, for example, that two opposing forces act on a magnetic needle, one from a vertical direction, namely from the magnetism of the Earth attempting to turn one of the ends of the needle towards the north; the other from the attraction by a magnet that tries to attract it and turn it towards itself. In that case it may happen that the vertical force is stronger than the attractive force, because the magnet can be placed at such a distance that it could turn the needle as if it was not magnetized, and would have no tendency to turn towards the north, but it is unable to overcome the tendency of the needle itself.

However, I am aware of an answer to this objection, which I submit to your judgment: namely, that the magnetic needle is not turned towards the north by the magnetic force of the earth, but by the force it has received from the magnet. Thus, assuming that these actions arise from certain currents of magnetic matter, this needle will have its own current, although less strong, yet substantially similar to that of the magnet.

The way, then, of learning whether the magnetic force of the earth's globe may have an immediate observable effect upon the magnet, is precisely what I have proposed to investigate, namely, if the change in situation noticeably counteracts the effect of the magnet. I say immediate, because it seems to me that the long-term experiences we have made show that certain long-term situations can weaken and ultimately destroy the angularity of a magnetized needle; and give some to an iron that has none. I speak of a needle, because it may be different with a magnet, which may have retained its initial verticity, and even more its attractiveness, even though it was in a constrained situation for a long time.

I have taken the liberty of making this digression in order to give you, Sir, the opportunity to enlighten me on this matter, which you can do better than anyone else<sup>183</sup>.

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*Letter:* **L-313 of 4 February 1697**

*Written by:* MAARTEN ETIENNE VAN VELDEN.

*Manuscript:* This letter is known only by reference in L.'s reply.

*Summary:* In this letter, VAN VELDEN writes that he has received the booklet that L.

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<sup>182</sup> No reply from L. to LEIBNIZ on this topic is known.

<sup>183</sup> LEIBNIZ's next known letter to L. is Letter 316 L-520 of 5 August 1715, *Collected Letters*, vol. 17.

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sent, which includes L.'s ideas about the rotation of Earth, which had caused VAN VELDEN to be suspended as a professor.

*Source:* Letter 181 L-314 of 12 February 1697 to MAARTEN ETIENNE VAN VELDEN.

*Remarks:* The booklet is either *Sesde Vervolg der Brieven, geschreven aan verscheide Hooge Standspersonen en Geleerde Lijden* (Sixth continuation of the letters, written to various high-standing persons and scholars), published in 1697, which included Letter 168 [101] L-294 of 10 July 1696, *Collected Letters*, vol. 11, to NICOLAAS WITSEN, or a separate copy of that letter. In it, L. refers to VAN VELDEN:

Now last year I was visited by a certain Professor (from another province), who complained that his thesis on the motion of the Earth, which he had committed to paper and published, had caused such a stir among other scholars or the authorities that his statements had to be recanted.

As we live in a country where we are allowed to express frankly our ideas on the motion of Earth, I often thought of the complaints of the said Professor and at last decided to commit to paper this my thesis, with which some years ago I tried to explain the matter to my satisfaction.

For a detailed review of the controversy involving VAN VELDEN, see STEVART, *Copernic & Galilée devant Université de Louvain: Process de Martin-Etienne van Velden*.

VAN VELDEN's previous letter to L. is Letter L-256 of 30 May 1695, in this volume. L. replied with two letters. Letter 148 L-261 of 12 July 1695, *Collected Letters*, vol. 11, discusses the metamorphosis of caterpillars and the necessity that each of them individually forms a cocoon for this. Letter 178 L-306 of 26 October 1696, *idem*, vol. 12, is a cover letter accompanying a presentation copy of L.'s printed letters, *Sesde Vervolg Der Brieven*.

The present letter is the last known letter that VAN VELDEN wrote to L., who replied to it with Letter 181 L-314 of 12 February 1697, *Collected Letters*, vol. 11, about his regrets that VAN VELDEN, owing to his defence of the Copernican world-picture, has encountered difficulties. In support of VAN VELDEN's standpoint, L. encloses a copy of a letter from a professor in Brabant, whose Copernicanism was confirmed by L.'s arguments.

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*Letter:* **L-317 a few months before April 1697**

*Written by:* PIETER VANDER SLAART.

*Manuscript:* This letter is known only by reference in another letter.

*Summary:* In this letter, VANDER SLAART writes that he would like to visit L. with a German doctor who has cured a sore on his leg with what the doctor calls "sympathetic powder". L. writes that he "consented" to the visit.

- Source:* Letter 184 [108] L-318 of 5 April 1697 to the Royal Society.
- Remarks:* Very little is known about the life of PIETER VANDER SLAART, the Rotterdam publisher of PIETER RABUS's *De Boekzaal van Europe*, in which Rabus published letters to and from L. as well as letters to L. from ANTONIO MAGLIABECHI reporting on books recently published in Italy.
- The "High German" is HENRICUS GEORGIUS REDDEWITZ de Rodachbrun, a young miracle doctor who on 22 September 1697 presented a thesis titled *Vero Catheticorum Usu* (True cathetical practice) to get his degree from the university in Harderwijk.
- L. recounts the visit by REDDEWITZ in Letter 184 [108] L-318 of 5 April 1697 to the Royal Society, *Collected Letters*, vol. 12. See *De Boekzaal van Europe* (January and February 1697), pp. 67-76, and ELSEN, "The Rotterdam Sympathy Case (1696-1697)".
- L.'s remark that "I consented" perhaps indicates another lost letter.

- Letter:* **L-319 of February-May 1697**
- Written by:* ANTONIO MAGLIABECHI.
- Manuscript:* No manuscript is known.
- Published in:* A. MAGLIABECHI, 1697: "XIV Hoofddeel", *De Boekzaal van Europe*, May and June 1698, pp. 541-544. – Dutch translation of the original Latin.
- Summary:* In this excerpt from his letter, MAGLIABECHI reports on a recent booklet that he thought might be of interest to L. and the Dutch readers of PIETER RABUS's *Boekzaal*. The booklet, written in Latin by JOANNES BAPTISTA SCARAMUCCI, was a long letter to MAGLIABECHI about an elephant skeleton recently discovered in Germany by WILHELM ERNST TENTZEL, who had reported his discovery to MAGLIABECHI in a letter of spring 1696.
- Remarks:* SCARAMUCCI's booklet is dated 23 and 28 January 1697. L. acknowledges its receipt in June 1697, so MAGLIABECHI sent it probably in February or March because his letters, this one enclosing a booklet, would often take months to reach Delft.
- RABUS did not publish it in the usual "Boeknieuws" section, which he used as a title for excerpts from a dozen other letters from MAGLIABECHI to L. at the end of an issue of *De Boekzaal van Europe*. Instead, because MAGLIABECHI sent the booklet with no other book news, RABUS devoted a whole chapter to it in an issue a year later. This letter, then, is the eighth of the fourteen letters with book news published in thirteen *Boekzaal* articles from March 1693 to October 1699.
- In one of his published letters, L. refers to this letter from MAGLIABECHI and reveals parts of the letter that PIETER RABUS had not included in the *Boekzaal*. In Letter 185 L-323 of 6 June 1697 to MAGLIABECHI, *Collected Letters*, vol. 12, L. writes,

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Recently I received your very welcome letter, with the printed letter addressed to You by the excellent Medical Doctor SCARAMUCCI, which letter speaks, *inter alia*, about the petrified Skeleton of an elephant, found in Saxony.

However this may be, I agree with those who believe that neither bones, nor shells, nor fishes are formed under ground, but that the earth has been subject to many mutations, as a result of which mountains and whole Regions have been converted into sea and conversely high Mountains have arisen from the sea, and thus we do not have to wonder that the bowels of mountains, viz. fishes, shells, etc., have been converted into Stones.

MAGLIABECHI's previous letter to L. is Letter L-310 of 18 December 1696, in this volume. L. did not reply to it before receiving the present letter. The reference to SCARAMUCCI's booklet, treated here as part of a separate letter, could have been extracted from that December 1696 letter, which was published earlier in *De Boekzaal van Europe*, January and February 1697, pp. 183-186. The next letter from MAGLIABECHI to L. is Letter L-322 of 1 June 1697, in this volume.

*Content:*                    *The following publication is listed under the heading "XIV Hoofddeel."*

- I.     JOANNIS BAPTISTA SCARAMUCCI<sup>184</sup>, *Meditationes familiares ad clarissimum et sapientissimum virum ANTONIUM MAGLIABECHIUM Bibliotecarium M.D.E. in epistolam ei conscriptam de sceleo elephantino a celeberrimo WILHELMO ERNESTO TENTZELIO historiographo ducali Saxonico, ubi quoque testaceorum petrificationes defenduntur et aliqua subterranea phaenomena examini subjiciuntur* (Urbino: LEONARD, 1697).

*There follows a discussion of this publication:*

The news that comes to us in this short writing from Italy is the following. I got it from Mr. LEEUWENHOEK, to whom Mr. MAGLIABECHI had recently sent it in a letter from Florence.

Mr. TENTZELIUS, mentioned in the title, published a letter a year or so ago<sup>185</sup>, in which he related that an elephant's skeleton was found in a place where it would not have been expected.

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<sup>184</sup> For JOANNES BAPTISTA SCARAMUCCI, see Letter L-275 of 23 October 1695, in this volume. MAGLIABECHI also reports on books by SCARAMUCCI in Letter L-275 of 23 October 1695 and Letter L-310 of 18 December 1696, both in this volume.

<sup>185</sup> *Epistola de sceleo elephantino Tonnae nuper effosso: ad virum toto orbe celeberrimum Antonium Magliabechium* (Letter about the recently excavated elephant skeleton of Tonna to the most famous man over all the world: ANTONIO MAGLIABECHI) was dated May 1696 from Gotha and published in Jena later that year. Reviews were published in *Journal des Sçavans* for 20 August 1696, p. 614-618, and in *Acta Eruditorum*, January 1697, pp. 10-14. The letter was published in its entirety on 30 November 1697 in *Philosophical Transactions*, vol. 19, no. 234, pp. 757-776, under the title *Wilhelmi ernesti tentzelii historiographi ducalis saxonici epistola de sceleo elephantine tonnae nuper essosso, ad virum toto orbe celeberrimum antonium magliabechium, serenissimi magni betruriae ducis bibliothecarium & consiliarium* (The ducal historian WILHELM ERNEST TENTZEL's letter about the recently excavated elephant skeleton of Tonna, to the most famous man over all the world, ANTONIUS MAGLIABECHIUM, the most serene librarian and counselor of the great Duke of



In a village of the landgraviate of Thuringia, called Tonna, there is a hill, on ground full of very white and pure sand. There, in the previous year, while digging, were found some elephant's legs, belonging to the hind legs, of nineteen pounds, also one leg, with its round capsule, weighing nine pounds, and another leg of thirty-two pounds, which appeared to be from the hip. After that more bones were taken from this place, namely a back bone with the ribs hanging from it, the bones of the front legs, the shoulder bone four feet long and two and a half spans wide: the vertebrae of the neck: at last a very large head with four jaw teeth, or molars, weighing twelve pounds, and two other teeth, eight feet long, and half a span thick.

All these remains Mr. TENTZELIUS saw himself with the Saxon-Prince<sup>186</sup>, and many counts, but it was a pity that, besides the molars, the head, the teeth, and other bones were so mouldered away that they fell off in chunks, and not a leg could be seen in its entirety.

As soon as one hears such a story that one may take as true, who would not, without difficulty, immediately conclude that those found legs were the true legs of an elephant, which the length of time had so consumed on that spot, for what is more natural? Earth has been subjected to infinite changes, and is still moving from one place to another; so that mountains and lands have become sea, and mountains have risen again out of the deep of the sea. So we need not be so surprised that certain bodies are found in the bowels of the mountains, which are also sometimes found petrified, that is, turned to stone<sup>187</sup>.

I know of many to whom this might thus arise as the most natural and simplest: but, nevertheless, two-fold opinions have arisen about this among the philosophers. The one, those who claimed the foregoing, namely that the legs were of an elephant: the second, such who would maintain that those legs were a certain ore or mountain matter, like wrought iron of the ever-playing and imitative Nature<sup>188</sup>. Mr. TENTZELIUS defended himself with the first opinion, and Mr. SCARAMUCCI also joins them.

This same Italian physician, after his meditation about this piece, leaves behind a letter, which he wrote to the renowned gentlemen extract makers in Leipzig<sup>189</sup> because of the *Febris hectica*, persistent fever<sup>190</sup>, from the city of his residence Urbino on the 28<sup>th</sup> of January of the year 1697.

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Tuscany). A note at the end explains that TENTZEL sent samples of the elephant bones to the Royal Society, "all of which they [members of the Royal Society] found agreeable to his description and ordered they should be carefully preserv'd in their repository."

<sup>186</sup> ALBERT V (1648-1699) was the duke of Saxe-Coburg at that time.

<sup>187</sup> Note the similarity of RABUS's two sentences from "Earth ... turned to stone" to the second paragraph under Remarks above from L.'s Letter 185 L-323 of 6 June 1697 to MAGLIABECHI. RABUS might have received a copy of L.'s reply to MAGLIABECHI along with SCARAMUCCI's booklet.

<sup>188</sup> Initially, TENTZEL's claim to have found a petrified elephant was disputed by others, but another such discovery of bones nearly in 1699 confirmed his claim.

<sup>189</sup> The first 20 pages of SCARAMUCCI's *De sceleto elephantino* contain the letter to MAGLIABECHI dated 23 January 1697. The final seven pages, dated 28 January, are addressed to the editors of OTTO MENCKE's journal *Acta Eruditorum*, a Latin-language monthly published in Leipzig between 1682 and 1731. TENTZEL was a frequent reviewer for the journal. In the 1680s, MENCKE published excerpts from five of L.'s letters and summaries of eight other letters. See Letter L-219 of 24 June 1692, in this volume.

<sup>190</sup> The phrase *Febris hectica* was put in a footnote. In his translation RABUS uses the term *taaije*, meaning tough or tenacious. The "hectic fever" in RABUS's footnote is a general term for a fever characterized by a daily spike in temperature. For another reference to "persistent fever", see Letter 270 L-457 of 25 July 1707 from L. to the Royal Society, *Collected Letters*, vol. 16.

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<i>Letter:</i>	<b>L-320 of May 1697</b>
<i>Addressed to:</i>	VICTOR VAN BEUGHEM.
<i>Written by:</i>	ANTONI VAN LEEUWENHOEK.
<i>Manuscript:</i>	This letter is known only by reference in another letter.
<i>Summary:</i>	With this letter to VAN BEUGHEM, L. encloses four copies of one of his books and instructions on how to distribute them, sending one to the Elector Palatine and the other three to ANTONIO MAGLIABECHI in Florence.
<i>Source:</i>	Letter 185 L-323 of 6 June 1697 to ANTONIO MAGLIABECHI.
<i>Remarks:</i>	<p>This is the only known correspondence between L. and VICTOR VAN BEUGHEM (†1715), who at the time was involved in the negotiations to end the Nine Years' War, which resulted in the Peace of Rijswijk later that year. He was on the staff of FRANZ-LUDWIG VON PFALZ-NEUBURG (1664-1732), at the time grand-master of the Teutonic Order, who would in 1716 succeed his brother JOHANN WILHELM as Elector Palatine.</p> <p>Electeur Palatine JOHANN WILHELM VON PFALZ-NEUBURG (1658-1716) had visited L. in 1695.</p> <p>The book that L. sent is <i>Continuatio Arcanorum Naturae Detectorum</i> (Continuation of nature's mysteries discovered), published in 1697, which contains two letters addressed to JOHANN WILHELM. Letter 157 [95] L-271 of 18 September 1695 discusses the generation of mussels and oysters as a refutation of the theory of spontaneous generation. Letter 160 [96] L-279 of 9 November 1695 discusses the little animals and their great numbers, supported by excerpts from 1677 letters on the same topic to HENRY OLDENBURG and WILLIAM BROUNCKER. Both letters are in this volume.</p>

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<i>Letter:</i>	<b>L-321 of 17 May 1697</b>
<i>Written by:</i>	HANS SLOANE (for the Royal Society).
<i>Manuscript:</i>	This letter is known only by reference in another letter.
<i>Summary:</i>	In this letter, HANS SLOANE writes a courteous letter to L. on behalf of the Royal Society about the two numbers of <i>Philosophical Transactions</i> that he is enclosing. He asks L. which numbers he is missing.
<i>Source:</i>	Letter 188 [110] L-329 of 10 September 1697 to the Royal Society.
<i>Remarks:</i>	HANS SLOANE (1659-1738), continues the exchange of letters between L. and SLOANE. His next letter to L. is L-369 of 8 June 1700, <i>Collected Letters</i> , vol. 13, there unnumbered and dated 28 May 1700 O.S.

- Letter:* **L-322 of 1 June 1697**
- Written by:* ANTONIO MAGLIABECHI.
- Manuscript:* No manuscript is known.
- Published in:* A. MAGLIABECHI, 1697: "Italiaansch Boeknieuws", *De Boekzaal van Europe*, July and August 1697, pp. 183-186. – Dutch translation of the book news in the original Latin or Italian letter.
- Summary:* In this extract from his letter, MAGLIABECHI reports on several recent books that he thought might be of interest to L., written in Italian and Latin by some fellow Italians. In a part of this letter not in the *Boekzaal*, MAGLIABECHI writes that he is sending, as a gift to L., a copy of a recently published book.
- Remarks:* RABUS regularly published excerpts from MAGLIABECHI's letters to L. This letter is the ninth of the fourteen letters with book news published in thirteen *Boekzaal* articles from March 1693 to October 1699.  
L. refers to this letter and the following letter from MAGLIABECHI of August 1697 in Letter 189 L-330 of 2 November 1697 to MAGLIABECHI, *Collected Letters*, vol. 12:

I inform You, Illustrious Sir, that I have duly received Your two letters addressed to me and that I learned from one of them that You have been pleased to make me happy (quite undeservedly) with a Book of such importance that scarcely 25 such books are found in the world, and moreover very handsomely bound; and that You entrusted that Book to the Very Noble Mr. LUCA GIAMBERTIUS, who, as you thought, had already reached Düsseldorf at that time.

According to n. 2 to Letter 189 L-330 in *Collected Letters*, the book that MAGLIABECHI sent is *Saggi di naturali esperienze fatte nell'Accademia del Cimento* (Essays on natural experiments done at the Accademia del Cimento) by LORENZO MAGALOTTI, the second edition of which was published in Florence in 1691.

See also L.'s Letter 186 L-324 of June or July 1697 to LUCA GIAMBERTI, *Collected Letters*, vol. 12, and GIAMBERTI's reply, Letter L-325 of 19 July 1697, in this volume.

MAGLIABECHI's previous letter to L. is Letter L-319 of sometime between February and May 1697, in this volume.

- Letter:* **L-325 of 19 July 1697**
- Written by:* LUCA GIAMBERTI.
- Manuscript:* This letter is known only by reference in another letter.

## ADDITIONAL LETTERS ...

*Summary:* In this letter, GIAMBERTI writes that he has asked an Italian physician, Mr. LOTTY,<sup>191</sup> to deliver to L. the book that ANTONIO MAGLIABECHI has sent to L.

*Source:* Letter 189 L-330 of 2 November 1697 to ANTONIO MAGLIABECHI.

*Remarks:* The two letters in July 1697 between GIAMBERTI and L. are the only known exchange of letters between them. After receiving a letter from ANTONIO MAGLIABECHI about entrusting a book as a gift for L. to GIAMBERTI, L. wrote to GIAMBERTI in Dusseldorf, Letter 186 L-324 of June or July 1697, *Collected Letters*, vol. 12, that GIAMBERTI should send the book via a freighter to Dordrecht. The present letter is GIAMBERTI's reply. The discussion about the book then shifted to an exchange of letters between L. and JOHAN ARNOLDI. The book is LORENZO MAGALOTTI's *Saggi di naturali esperienze fatte nell'Accademia del Cimento* (Essays on natural experiments done at the Accademia del Cimento). For an overview, see the Remarks for Letter L-333 of 15 January 1698 from ARNOLDI to L., in this volume.

According to L.'s Letter 189 L-330 of 2 November 1697 to ANTONIO MAGLIABECHI, *Collected Letters*, vol. 1, p. 201, n. 3, "LUCA GIAMBERTI was gentleman-in-waiting to GIAN CASTONE DE' MEDICI (1671-1737). During his stay abroad (Düsseldorf and Reichstadt) he corresponded with MAGLIABECHI, *inter alia*, about the lost book for L."

*Letter:* **L-326 of August 1697**

*Written by:* ANTONIO MAGLIABECHI.

*Manuscript:* No manuscript is known.

*Published in:* A. MAGLIABECHI, 1697: "Italiaansch Boeknieuws", *De Boekzaal van Europe*, September and October 1697, pp. 376-378. – Dutch translation of the original Latin and Italian.

*Summary:* In this excerpt from the letter, MAGLIABECHI reports on several recent books that he thought might be of interest to L and the readers of the *Boekzaal* by some fellow Italians.

*Remarks:* RABUS regularly published excerpts from MAGLIABECHI's letters to L. This letter is the tenth of the fourteen letters with book news published in thirteen *Boekzaal* articles from March 1693 to October 1699.

L. refers to this letter and MAGLIABECHI's previous Letter L-322 of 1 June 1697, in this volume, in Letter 189 L-330 of 2 November 1697 to MAGLIABECHI, *Collected Letters*, vol. 12: "I inform You, Illustrious Sir, that I have duly received Your two letters addressed to me."

<sup>191</sup> This Italian physician, Mr. LOTTY is not identified. His family name was probably 'Lotti', perhaps a relative of the Italian composer ANTONIO LOTTI (1667-1740).

- Letter:* **L-327 of 18 August 1697**
- Written by:* JAN VAN LEEUWEN.
- Manuscript:* This letter is known only by reference in L.'s reply.
- Summary:* In this letter, VAN LEEUWEN writes to L. to follow up on their conversation by sending a box with straw and wheat ears that VAN LEEUWEN's neighbors claimed were ruined by honey-dew falling from the sky.
- Source:* Letter 187 [109] L-328 of 3 September 1697 to JAN VAN LEEUWEN.
- Remarks:* This letter and L.'s reply two weeks later are the only known letters between L. and VAN LEEUWEN.
- The JAN VAN LEEUWEN who wrote this letter is either the second husband or the brother of L.'s niece RIJCKJE VAN LEEUWEN (1656-1705), who was the daughter of L.'s youngest sister CATHERINE (1637- after 1691) and her husband CLAES JANS VAN LEEUWEN (?-1671). Husband JAN wrote a letter to his son and daughter-in-law on 5 April 1717 about a visit to his home in Rotterdam by PETER I ('the Great'), Czar of Russia, who called him his "old friend" and "steward" (*oude vrient en hofmeester*). See JACOBUS SCHELTEMA, *Rusland en de Nederlanden beschouwd in derzelver wederkerige betrekkingen*, vol. 3, p. 450. Brother JAN (1665-1725) was the cashier of the Bank van Leening in Zierikzee. In Letter 151 [92] L-264 of 15 August 1695, *Collected Letters*, vol. 11, L. called him "one of my closest friends" (*een van mijne naaste vrienden*).
- On the same day that L. wrote this reply to VAN LEEUWEN, he was staying at the home of RIJCKJE VAN LEEUWEN. A week later, he wrote to the Royal Society in Letter 188 [110] L-329 of 10 September 1697, *ibidem*, "Being at Rotterdam on the third of September and arriving about noon at the house of a relative of mine".

- Letter:* **L-332 of sometime between late 1697 and early 1698**
- Written by:* ANTONIO MAGLIABECHI.
- Manuscript:* No manuscript is known.
- Published in:* A. MAGLIABECHI, 1698: "Italiaansch Boeknieuws", *De Boekzaal van Europe*, January and February, pp. 180-182. – Dutch translation of the original Latin and Italian.
- Summary:* In this excerpt from his letter, MAGLIABECHI writes to praise L.'s work and express regret that the book he sent has not been received by L. He also includes news of books that he thought L. and the readers of *De Boekzaal* would be interested in from some Italian writers.

## ADDITIONAL LETTERS ...

**Remarks:** RABUS regularly published excerpts from MAGLIABECHI's letters to L. This letter is the eleventh of the fourteen letters with book news published in thirteen *Boekzaal* articles from March 1693 to October 1699.

L. refers to this letter from MAGLIABECHI in his reply, revealing parts of the letter that RABUS did not include in the *Boekzaal*. In Letter 191 L-336 of 20 February 1698 to ANTONIO MAGLIABECHI, *Collected Letters*, vol. 12, L. writes,

In due time, Most Illustrious Sir, the letter which you again thought fit to write to me was delivered to me by the Very Famous Mr GRONOVIVS. I would inform you that I found it very welcome and a great pleasure to read, especially because I saw that it is again full of very evident marks of Your usual benevolence and kindness towards me; in fact, you say that you greatly regret that the wonderful and precious Book with which out of Your notable generosity you had decided to make me quite undeservedly happy has not reached me.

For the only known letter of JACOB GRONOVIVS (1645-1716) to L., see Letter L-179 of 11 July 1686, in this volume. For other letters from MAGLIABECHI to L. involving GRONOVIVS, see Letter L-181 of 10 September 1686, Letter L-272 of 12 October 1695, Letter L-273 of 14 October 1695, Letter L-280 of 5 November 1695, and Letter L-290 of 5 June 1696, as well as Letter L-435 of sometime before March 1705 and Letter L-465 of 10 July 1708, all in this volume.

MAGLIABECHI's previous letter to L. is Letter L-326 of August 1697, in this volume. L. replied to the present letter with Letter 191 L-336 of 20 February 1698, *Collected Letters*, vol. 12.

**Letter:** **L-333 of 15 January 1698**

**Written by:** JOHAN ARNOLDI.

**Manuscript:** This letter is known only by reference in another letter.

**Summary:** In this letter, ARNOLDI writes to L. that one of the domestic servants of the prince of Tuscany has asked him to find out what had happened to the book titled *Saggi di naturali esperienze* that ANTONIO MAGLIABECHI, the prince's librarian, had given to LUCA GIAMBERTI to take to Düsseldorf and forward to L. ARNOLDI traced the book by finding a Mr LOTTY, to whom GIAMBERTI had given the book to deliver to L. LOTTY had left for England, but not before he offered to sell the book to the secretary of the prince of Vaudémont. ARNOLDI writes to ask L. how he should proceed.

**Source:** Letter 191 L-336 of 20 February 1698 to ANTONIO MAGLIABECHI.

**Remarks:** This letter begins an exchange of letters between L. and ARNOLDI about the gift of a book that ANTONIO MAGLIABECHI sent to L. It is followed by L.'s Letter 190 L-331, written between 15 January and 20 February

1698, not as is says in *Collected Letters*, vol. 12, p. 205, “Late 1697 or early 1698”. In it, L. writes that ARNOLDI should do whatever it takes to get the book and that he will pay whatever it costs.

In Letter L-339 of April 1698, ARNOLDI writes that he spent a pistole to get the book and leaves it to L. to decide whether to compensate him. In Letter L-340 of April 1698, L. replies that he will pay the pistole and whatever other expenses ARNOLDI incurred.

Almost a year later, in Letter L-351 of February 1699, ARNOLDI writes that he has been reimbursed for the pistole he spent to get the book. He is returning the pistole that L. had earlier sent as compensation. In Letter L-352, written before 28 February 1699, L. replies that ARNOLDI should repay him by boat. These letters are all in this volume.

This exchange is reported by L. in four letters to MAGLIABECHI, all in *idem*, vol. 12: Letter 191 L-336 of 20 February 1698, Letter 192 L-342 of 17 April 1698, Letter 194 L-346 of 14 August 1698, and Letter 198 L-354 of 28 February 1699.

The book in question is LORENZO MAGALOTTI’s *Saggi di naturali esperienze fatte nell’Accademia del Cimento* (Essays on natural experiments done at the Accademia del Cimento), the second edition of which was published in 1691 in Florence. In Latin translation, it became the standard laboratory manual of the 18<sup>th</sup> century.

For LUCA GIAMBERTI, see Letter L-325 of 19 July 1697, in this volume. GIOVANNI COQUS was his travelling companion. The prince de Vaudémont is CHARLES HENRI OF LORRAINE (1649-1723). His secretary at the time was CLAUDE FRANCOIS CANON (1629-1698). See Letter 191 L-336 of 20 February 1698 to ANTONIO MAGLIABECHI, *ibidem*.

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<i>Letter:</i>	<b>L-334 of 19 January 1698</b>
<i>Addressed to:</i>	GOVERT BIDLOO.
<i>Written by:</i>	ANTONI VAN LEEUWENHOEK.
<i>Manuscript:</i>	This letter is known only by reference in BIDLOO’s reply.
<i>Summary:</i>	In this letter, L. writes about how little animals can get into the human body through drinking canal water and preparing food.
<i>Source:</i>	Letter L-338 of 21 March 1698 from GOVERT BIDLOO to L.
<i>Remarks:</i>	<p>This is the first known exchange of letters between L. and BIDLOO, the professor of anatomy and medicine at Leiden University, who visited L. several times. BIDLOO’s reply, a thorough study of the worms found in a sheep and humans, was published separately and is found in this volume as Letter L-338 of 21 March 1698.</p> <p>Their second exchange of letters was eight years later. L. wrote Letter 262 L-444 of 7 March 1706, <i>Collected Letters</i>, vol. 15, to BIDLOO</p>

## ADDITIONAL LETTERS ...

investigating the effect of an extract of the seeds of an East Indian tree on the coagulation of the blood and the effects of a drink from hempseed. In reply, Letter L-445 of 12 March 1706, in this volume, BIDLOO sends L. a recently published dissertation on the formation of chyle in the intestines.

For GOVERT BIDLOO (1649-1713) and an overview of his correspondence with L., see the Remarks to the long Letter L-338 of 21 March 1698.

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<i>Letter:</i>	<b>L-335 of February 1698</b>
<i>Addressed to:</i>	JOHAN ARNOLDI.
<i>Written by:</i>	ANTONI VAN LEEUWENHOEK.
<i>Manuscript:</i>	This letter is known only by reference in another letter.
<i>Summary:</i>	In reply to ARNOLDI's letter explaining the status of the book sent to L. by ANTONIO MAGLIABECHI, L. writes that ARNOLDI should do whatever it takes to get the book and that he will pay whatever it costs.
<i>Source:</i>	Letter 191 L-336 of 20 February 1698 to ANTONIO MAGLIABECHI.
<i>Remarks:</i>	For an overview of the exchange of letters between ARNOLDI and L., see the Remarks for Letter L-333 of 15 January 1698, in this volume.

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<i>Letter:</i>	<b>L-337 of sometime before March 1698</b>
<i>Written by:</i>	ANTONIO MAGLIABECHI.
<i>Manuscript:</i>	This letter is known only by reference in L.'s reply.
<i>Summary:</i>	Along with this letter, MAGLIABECHI sends a poem.
<i>Source:</i>	Letter 192 L-342 of 17 April 1698 to ANTONIO MAGLIABECHI.
<i>Remarks:</i>	The poet and poem referred to by L. in his reply are unknown.

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<i>Letter:</i>	<b>L-338 of 21 March 1698</b>
<i>Written by:</i>	GOVERT BIDLOO.
<i>Manuscript:</i>	No manuscript is known.
<i>Published in:</i>	G. BIDLOO 1698: <i>Brief van G. Bidloo aan Antony van Leeuwenhoek; Wegens de dieren, welke men zomtyds in de lever der Schaapen en andere beesten</i> , 12 figures



(Delft, Henrik van Kroonevelt).

G. BIDLOO 1698: *Observatio, de animalculis* ..., 12 figures (Lugduni Batavorum, Jordanum Luchtman) – Latin translation.

G. BIDLOO 1715: *Observatio, de animalculis* ..., 12 figures (Lugduni Batavorum, Samuelem Luchtman) – Latin translation with separate pagination in the middle of BIDLOO's *Opera omnia anatomico-chirurgica*.

S. HOOLE 1798: 'Of an animalcule or small living creature, which is sometimes found in the livers of sheep and other beasts,' *The Select Works of Antony van Leeuwenhoek*, vol. 1, part 2, pp. a-f [between p. 143 and p. 146], 9 figures (London, Henry Fry). – English translation of an excerpt.

J. JANSEN, ed. 1972: *Letter from G. Bidloo to Antony van Leeuwenhoek* (Nieuwkoop: De Graaf). – Dutch facsimile with complete English translation.

*Summary:* In this letter, BIDLOO presents a thorough study of the worms found in a sheep's liver and its nearby parts. He describes the worms' bodies, where they are found, their numbers and propagation, and how they cause diseases. He lists many of the authors who have found worms in various animals, including humans, and in which parts of their bodies the worms were found. He argues against the practices of quacks and many physicians who do not reason from evidence and mistake the symptoms of diseases for their causes.

*Figures:* Fourteen figures illustrate this letter. The original drawings have been lost. In KROONEVELD's editions, figures 1–3 are inserted on p. 4, an unlabeled figure is inserted on p. 5, figure E is on p. 6, and the remaining figures face p. 7.

*Remarks:* In 1694, GOVERT BIDLOO (1649-1713) was appointed professor of anatomy and medicine at Leiden University, succeeding ANTON NUCK. Two years later, he was elected a fellow of the Royal Society, and in 1701 he became the personal physician of WILLEM III, the Dutch stadtholder and King of England, Scotland and Ireland. In 1686, BIDLOO wrote the libretto for the first-ever Dutch opera, JOHAN SCHENCK's *Ceres, Venus en Bacchus*. He was succeeded at the university by HERMAN BOERHAAVE. BIDLOO visited L. several times.

In the present letter, BIDLOO mentions some letters that have not survived and are not otherwise known. In addition to the lost Letter L-334 of 19 January 1698, only one letter that L. wrote to BIDLOO is known, Letter 262 L-444 of 7 March 1706, *Collected Letters*, vol. 15, along with BIDLOO's reply, Letter L-445 of 12 March 1706. Both of those are also lost but L. quoted from Letter 262 L-444 at length in Letter 264 L-447 of 20 April 1706 to the Royal Society, both in *ibidem*. The lost letters are in this volume.

BIDLOO's present letter to L. was printed in Delft by HENRIK VAN KROONEVELD, who lived next door to L. and who also printed many of his letters, including *Sevende Vervolg der Brieven*, the 1702 edition, copies of which often have BIDLOO's letter bound after the index. It was summarized and reviewed anonymously in *Philosophical Transactions*, vol.

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22, no. 263 (April 1700), p. 571 (should be p. 579). For the Dutch text see JANSEN, 1972.

*English translation of the original Dutch text, printed in BIDLOO 1698:*

Letter from G. BIDLOO to ANTONI VAN LEEUWENHOEK

about the animals that are sometimes found in the liver of sheep<sup>192</sup> and other beasts.  
Printed in Delft, by HENRIK VAN KROONEVELT, Bookseller. 1698.

G. BIDLOO;  
wishes for the famous Mr. ANTONI VAN LEEUWENHOEK  
advancement, contentment, and honour in the examination of animal bodies and  
other things.

Sir,

Your courteous letters, kind reception, and pleasant discussions on many things worth knowing oblige me respectfully to present to you the following observation, on which we recently had a conversation, the more so because I have become fully convinced of its truth also through your own notes and contemplations.

After I had many times found, now accidentally, now intentionally, in the liver of human beings and beasts various diseases, tumours, stones, substances, and especially in those of sheep, a kind of animal the name (worms), description, and representation of which seems to me not to be in agreement with their makeup, or at least very little, I endeavoured to examine this animal. But as I have always detested the odious habit of disparaging the work of others, before saying anything on the subject, I sought what renowned, learned, and diligent men might have discovered about this animal. To avoid searching everywhere and at random among them, I perfunctorily perused the writers of recent times and of our own and found that the never sufficiently praised FABRITIUS HILDANUS, in the first part of his surgical notes, page 74, asked<sup>193</sup>:

What is more curious, what is more astonishing than that worms are found in the gall-bladder?

Nevertheless, I found this confirmed by the statement and the authority of the credible Mr. GALENUS WIERUS, in his letter written from Düsseldorf on the 16<sup>th</sup> of June of the year 1602<sup>194</sup>.

The French (see their journal, under the title of *Journal des Sçavans*, published in the year 1668), being engaged in a detailed examination of the tube through which the gall is

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<sup>192</sup> L. wrote earlier about the liver fluke (*Fasciola hepatica* L.) in Letter 12 [7] L-016 of 19 October 1674, *Collected Letters*, vol. 1, pp. 171-177; in Letter 42 [27] L-078 of 21 February 1679, *idem*, vol. 2, pp. 415-419; and in Letter 207 [122] L-364 of 2 January 1700, *idem*, vol. 13, pp. 5-7. See DOBELL, "Discovery", pp. 345-346.

<sup>193</sup> WILHELM FABRICIUS VON HILDEN or GUILIELMUS FABRICIUS HILDANUS (1560-1634) was a German surgeon. See his *Observationum et curationum chirurgicarum centuriae* (ed. Lyon, 1641), p. 74. See also the Dutch edition, *Aanmerkingen van Guilbelmus Fabricius Hildanus*, p. 66: "Een steen, en wormen, in de Gal-blaas gevonden" (A stone and worms found in the gallbladder). This edition of 1656 was translated by the Delft surgeon NICOLAAS VAN ASSENDELFT (1627-1662).

<sup>194</sup> GALENUS WIER (1547-1619) was a Dutch physician and tutor of HILDANUS. BIDLOO refers here to WIER's letter to HILDANUS, published in his *Aanmerkingen*, pp. 61-62.

conveyed to the tube of the gallbladder, found these so-called worms in the gall ducts of a sheep<sup>195</sup>. Since at that time there was a general fear in Paris of the plague and they had perhaps read the treatise by ATH. KIRCHERUS on the plague, published in the year 1658<sup>196</sup>, some of them wanted to have it considered whether these little animals might not be forebodings of that sad disease, while CORN. GEMMA speaks of something similar that happened in Holland around the year 1562<sup>197</sup>. He maintains that the frequent diseases and high mortality among beasts are forebodings of those of people. He compares the form of the little animal to that of skullcap, which grows in the pastures, and further describes it as follows:

They are flat, oval, and a little pointed towards one end of the circumference. The head sticks out a little at the other end, which represents the stalk of the leaf. They are whitish on the belly. On the back, they are laced with many spots and threads of a dark brown colour, which makes them resemble the sole. The head has a snout pierced by one small hole, except for another that is much larger and is found around the middle towards the bottom.

He adds the following delineation and this explanation:

1. Represents the animal lying on its back, 2. On its belly, 3. The leaf of the above-mentioned herb as described by BAUHINUS<sup>198</sup>.



He does not add anything further except a general demonstration of the uncertainty of the prognoses, predictions, and presagings of the plague.

What the gentlemen BARTHOLINUS, FABRITIUS, HAUPTMANNUS, TARDINUS<sup>199</sup> and others say about these as well as some other little animals is found collected in the

<sup>195</sup> "Extrait d'une Lettre de M.P. à M.\*\*\* sur le sujet des vers qui se trouvent dans le foye de quelques animaux" (Extract from a Letter from M.P. to M.\*\*\* on the subject of worms found in the liver of some animals), *Journal des Sçavans* (30 July 1668), pp. 144-149.

<sup>196</sup> ATHANASIVS KIRCHER (1602-1680) was a German Jesuit scholar. See his *Scrutinium physico-medicum contagiosae luis quae dicitur pestis* (1658), translated into Dutch by the surgeon ZACHARIAS VAN DE GRAAF as *Naturelijke en Geneeskonstige navorsching der Peste* (1669).

<sup>197</sup> This section, including the three figures following the quotation, comes from the *Journal des Sçavans*. CORNELIS GEMMA (1535-1579) was a physician, astronomer, astrologer, and professor of medicine at the university in Louvain.

<sup>198</sup> The mentioned herb is the *sideritis glabra arvensis*, as noted in the text of the *Journal des Sçavans*. See the *Histoire des plantes de l'Europe*, vol. 1, p. 418, by GASPARD BAUHIN (1560-1624), a Swiss botanist.

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exact journals of the German academy<sup>200</sup> in the year 1670 in the 128<sup>th</sup><sup>201</sup>, and in 1675, 1676 in the notes of Mr. FROMANNUS on the 249<sup>th</sup> and subsequent pages<sup>202</sup>. At about the same time, to wit in the year 1671, Mr. FRANSISCUS REDI, known universally through his merits, in his treatise on the bloodless animals on the 302<sup>nd</sup> page, also spoke about these little animals and described their form as follows<sup>203</sup>:



Comparing them to a pumpkin seed or a small myrtle leaf with a short stalk; saying further that they are a milky white and provided with yellowish green tubes; have a mouth or hole not far from the tail in the flat of the belly; are often found not only in the gallbladder, but also in all the vessels of the liver, except the arteries, of sheep.

You may see in what follows which of all these, according to my findings, are to be believed.

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<sup>199</sup> THOMAS BARTHOLIN (1616-1680) was a Danish physician, mathematician, and theologian, whose sons CHRISTOPHER and CASPAR visited L. in 1674 with HOLGER JACOBI. JOHANNES FABER (1574-1629) was a German anatomist, botanist, and papal physician. AUGUST HAUPTMANN (1607-1674) was a German doctor, alchemist, and hydrotherapist. JEAN TARDE (1562-1636) was a French Copernican and astronomer.

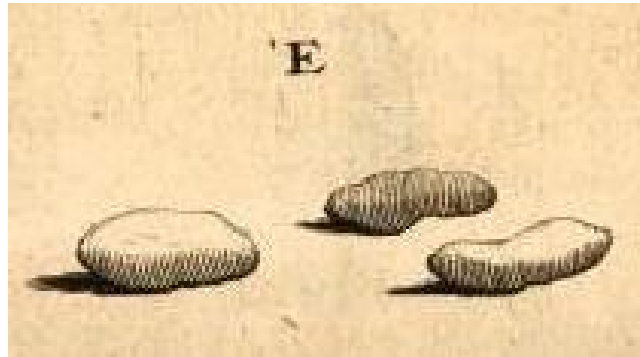
<sup>200</sup> BIDLOO called it the *Hoogduytsche konstgenoodschap*, literally, the High German Society. Officially the *Deutsche Akademie der Naturforscher Leopoldina* (the Academy of Naturalists "Leopoldina"), it was founded in 1652, based on models in Italy. In 1687, Emperor LEOPOLD I raised it to an academy and named it after himself. He was only 12 when it was founded. Today it is the National German Academy of Sciences. Starting in 1670, the society published the journal *Miscellanea Curiosa, sive Ephemeridum Medico-Physicarum Germanicarum Academiae Naturae Curiosorum* (Leipzig, various years), hereafter cited as *Misc. Curiosa*. See JEDLITSCHKA, "The Archive of the German Academy".

<sup>201</sup> Printing error for *Misc. Curiosa*, vol. 1 (1670), p. 148: BIDLOO refers here to a summing-up by BARTHOLIN of microscopical observations concerning "Sanguis verminosus" (Wormy blood), citing the work of others, including FABER, HAUPTMANN and TARDE.

<sup>202</sup> JOHANN CHRISTIAN FROMMANN (1623-1695) was a physician from Saxe-Coburg. See his "De verminosus in vibus et juvenis reperto hepate" (Of the vermin found in the liver of cattle and oxen), *Misc. Curiosa*, vol. 6-7 [for the years 1675-76] (1677), pp. 249-255.

<sup>203</sup> FRANCESCO REDI (1626-1697) was an Italian physician, naturalist, biologist, and poet. See his *Experimenta circa generationem insectorum*, p. 302. The cited figure on page 303 is labeled "Vermis vervecini hepatis" (Worms in the liver of a castrated lamb).

Finally, I found that also Mr. FREDERIK RUYSCHE, on the 84<sup>th</sup> page of his observations<sup>204</sup>, makes mention of the previously mentioned little animals. But how far his description departs from the truth and the form of this little animal (for he says little about it except this and the place where it was found by him in the liver of sheep) will become apparent when one will please to compare his description with my true one. I trust no one will take his description to be that of an animal, as it is not like a living creature, but rather that one will take it to be glandular tissue or some other substance. Nevertheless, he says, referring to letter E<sup>205</sup>.



Worms taken out of the tube of the gallbladder and the gall tubes of a sheep.

In order to treat the named little animal in an understandable order, I will begin my remarks and observations first with its body; second, the places where it is found; third, their number, growth, and procreation; and fourth, showing that these and other little animals, living in the liver and other parts of the body, can be the causes of some diseases and their consequences.

I.<sup>206</sup> Concerning the form, circumference, and likeness of these little animals, compared (apart from the aforesaid likenesses) now to the leaf of moneywort, now to a leech, they bear a great likeness, in miniature, to our fish the sole or the flounder, as is seen in the first drawing. A. represents one of these little animals, in the size in which they are commonly found, on the boss or backside, B. the same overturned and so seen from the belly. C. shows one of the young of the same, viewed in the first way, and D. in the second way. Under letters E. and F., the little animal is drawn with the whole body magnified, on both sides.

<sup>204</sup> FREDERIK RUYSCHE (1638-1731) was a Dutch botanist and anatomist. One of BIDLOO's teachers, FREDERIK RUYSCHE had quarreled publicly with BIDLOO over anatomical matters. See his *Observationum anatomico-chirurgicarum centuria*, p. 83-84.

<sup>205</sup> RUYSCHE, *Observationum anatomico-chirurgicarum centuria*, figure facing p. 84.

<sup>206</sup> BIDLOO numbered only this first section, about the worm's body.



One seldom sees them living because the disease is not known by outward signs. The beast that is subject to it sometimes appears fat and healthy, and the liver is not examined until after death, while these little animals also cannot endure cold or the addition of any other fluid. I saw them living in large numbers after having frequently stayed during a slaughtering specially appointed for that purpose, the last time on the 13<sup>th</sup> of March. I saw as well at the same time a kind of short, thick worm in the liver of a cat. When they begin to become cold and thus lose their motion, they resume the same when they are held in a warm hand or when the liver is laid in warm water. Their motion is, like that of the fish mentioned above, undulating, the sides of the body being continually overturned, and thus the head first gathered in, the body made broader, and after that stretched in length. Their colour is a brownish yellow; the belly is totally flat and much paler than the back. Further their skin is rough, filled with points, and so transparent that the bowels and vessels can be discerned through it on both sides. Their head (see the magnified drawing under letter G.) has the form of a pointed circle, the mouth swelling upwards and when open, oval, almost in the manner of a carp. The eyes (see as above the letters H. and I.), which are very stretched forth, are surrounded with a K. cartilaginous ring and, as in many flat fishes, are placed not on both sides, but on one side of the head section.

The heart is so near to the head and the intestines again lie so close to the same that I doubt whether there is anything by which the head is distinguished from the rest of the body, which yet in most animals is the case. From the heart, two vessels spread through the whole body, leaving a wide distance between places in the middle of the back, along its length, in the way seen under letter L. Between them run M. very thin little tubes or little threads, in which no fluid can be discerned. In the former vessels, I find two kinds of fluid, that is, in some, brownish-yellow and sometimes purplish, in others, pale green, both always slimy, but yet flowing towards the heart (even when the little animal is dead and is lifted up by the hind part) and, when one lifts up the head, flowing away from it again towards the hind end of the body. Some gentlemen wondered that when the little animals are alive this flowing to and fro goes on much more slowly than when they are dead (though nevertheless the fluid in them is thinner while they are alive than after their death). But when they thought of the draining tubes and the pressing-forward motion of the heart, the reasons and afterwards the effect of the argument became evident and clear to them.

The guts have their exit or navel, so through a bad habit this opening in fishes is called, on the right side of the body, very close under the head, wherefore they lie very closely pressed together. A blackish mass, placed at the beginning of the gut, I take to be the liver.

In all the animals that I have examined, I find between this liver and the gut the innumerable multitude of oval particles of which you speak in your letter. Like you, I experienced that hundreds of them show a faint red colour when taken together, hardly making up the size of a coarse grain of sand<sup>207</sup>. They appear to me the spawn or eggs of these animals. But whatever diligence I have likewise applied, I have not yet succeeded in distinguishing each animal's sex with complete certainty. Being oft times in doubt, it seems to me to come nearest the truth that they belong to that kind of animals in which one sees a double sex, or that for me, until now, no male has fallen to hand.

It is found in haddocks, amongst others, how far the number of females exceeds that of the males in some aquatic animals. Whether these animals should be called water worms or fishes serves no purpose because one experiences the same also in animals living on the land, like slugs and others. The smallness of the body also is not to the point, for there are many kinds of water and land animals of the same size and growth. Nay, thousands are seen daily, even in rainwater, that are a thousand times smaller and have various forms. I request you to please give your observation on the above. I also find, as you pleased to share with me, that wherever one sees the young of these little animals, many of the above-mentioned oval particles make their appearance in the fluid, being dark-coloured gall, in which the particles, however small they are, yet are all found to have one and the same form and to be transparent.

The tail or the end, though similar to the whole body, is much weaker than any of the other external parts, breaking at the least rough touch.

The places where I have until now found these little animals are the vessels, tubes, and gathering places suitable for servicing the gall. Nevertheless, most are in the gall tubes, which in that case protrude everywhere beyond measure and in great bosses, circles, bends, and little housings, whose cavities, often an inch and a half across<sup>208</sup>, stick out at the places where these little animals are found packed together, and those places are also hard like cartilage. In the small gall pipes, they lie lengthwise and sometimes rolled up at least three times. I suppose that it is due to this that many people, being deceived about their form, have described them as oval worms. And yet, however wrapped up they may be, they

<sup>207</sup> About 0.87 mm. L. often used the same measure.

<sup>208</sup> A Rhineland *inch* is 2.62 cm. An inch and a half is about 3.9 cm.

spread out flat at once, even after death, when thrown into warm water. Also, they change in colour somewhat (to wit, becoming pale).

One seldom sees these little animals without seeing tumours or ulcers in the liver, too. But however many, how few, how small or big the little animals were, I never found any alteration in the usual form of the blood vessels, none excepted, or in the blood therein. Even less so did I find the little animals in the cavities, the nerves perfectly keeping their general course, stretch, and composition. I find the water<sup>209</sup> vessels throughout the body different from their usual condition, some being stretched out beyond measure, others wholly flat, nay, hardly visible, and the cavity of the belly is full of water in that case. The glandular tissue of the liver, in its spaces between, is bent outward, every gland filled and penetrated with fluid, distinctly visible, and as it were separated from its neighbour, even the outer membrane of the liver thicker and harder than usual. It will be very credible that these little animals never lodge in the tissue of the liver or its blood vessels when it is argued that they must be introduced into them either from the outside – which no one will want to defend – or through the blood, gall, or water pipes.

First of all, as the arteries are strong in composition and further very narrow, even so narrow near their ends, being in the liver, that they can contain none of these little animals (I here keep silent on the counter-argument to be derived from the motion of the blood and other causes), I conclude with Mr. REDI that it is impossible that they can stay and grow in the arteries but not with the opinion (with all respect to his great name) that they are not in the other vessels either. For if (as he asserts) they are generated in the gallbladder and, having crept through it, bore by biting through the common gall tube and thence again through and into the blood vessels, one would have to see everywhere blood that has been shed or is pouring out, which I have never yet experienced. That they should there, increased in number, again gnaw through the blood vessels, thus pressing on into the glandular tissue of the liver and make little cavities there, apart from its improbability is also contrary to experience. When these little animals are in there, the very smallest gall pipes, even near the thinnest circumference of the liver, are so bent outward, enlarged, and widened that the glandular tissue is united with the outer membrane, not the least substance that looks like blood being found in the little cavities.

The number of these animals is commonly large, yet it varies and depends on whether they have had more or less time to breed. Out of one liver, I was able to take 870 whole ones besides many that were broken and spoiled when cut through and pulled out; out of another, only 10 or 12. They are found in various kinds of beasts. Hunters on the Veluwe tell me that they have found them in deer, wild boars, and other big and small game. I often saw them in calves and in a young bull, a few days ago in a heifer, but they were greenish black. It has long been known to many people and to you that they are found in sheep just from the womb, in lambs one year old and older, and even in sheep grown old. Many times, I have found worms on and near the liver of human beings, but of quite a different form and make. Although now that I have come to know the little animals in question in more detail, and in particular how they can roll themselves up, I dare to say that I saw them some years ago in a human liver, yet, before confirming this, I will take every opportunity (and I request you to do the same) to discover the truth about this. Some authors try to deduce the birth, first cause, substance, and reproduction of these little animals from rotting, spoiling, lack of salt, intemperate fluid or heat, and other nonsensical thoughts, words, and qualities, such as that, once they have been produced from rotting

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<sup>209</sup> *water*. Today called lymph.



matter, *Multiplicativi sui mediante sive operante facultate foveatrice*<sup>210</sup>, and other trifling whimsey. I reject it all, establishing that these animals like all living or moving things come forth from their like, i.e. from eggs, seed, spawn, in brief, a thing similar to them and of the same composition. For I consider that the age in which we are living has advanced too much in the knowledge of tangible and visible (I am silent about other) things, too much in the proper foundation of argumentation, and too much on the road of proper inquiry for us to occupy ourselves and others any longer with such stuffy and dull old wives' and dribbling children's tales. On the basis of unenlightened paganism, they are more in agreement with a tale of an invented dream god or a Lallus<sup>211</sup> at the cradle than with the decent conversation of even moderately intelligent people. I should discuss the above subject at greater length if this matter had not been dealt with at large a short time ago by Mr. C. VAN STEENEVELD<sup>212</sup> in the discourse on worm ulcers, in which, refuting the 64<sup>th</sup> page of the observations written by Mr. FREDERIK RUYSCH<sup>213</sup>, he clearly convinces the same of the aforementioned truth. See the aforementioned treatise, from the 9<sup>th</sup> to the 18<sup>th</sup> page, where you will find your name honoured and your findings put in to reinforce the evidence.

I find the circumstances very probable (having received information on this from farmers, graziers, and butchers) under which, as you already wrote to the Royal Society in England in 1679<sup>214</sup>, you think these little animals and their eggs get into sheep (for other animals and their eggs, the same will have to be taken for granted). In damp summer and autumn times, springing up from the earth, they were drunk in with the fluid in which they live or into which they get. However (with my apologies to you), I find it very probable that in no way would the same boring, pressing through the stomach and guts out of the cavity of the belly into the vessels of the liver, there procreating and making openings in the stomach and guts, be the working causes by which (out of the little holes) the great power of the waters, which sometimes were found in the cavity of the belly, poured out and leaked out. Because they come, now already being animals, into the stomach and guts, they can already bore through the same. So will they also surely bore through the membranes and other bowels lying on and near the previously named, like the pancreas, kidneys, and spleen and be found in the same (which I have never yet seen).

Add to this, secondly, that they would then be sufficiently visible enough everywhere and must also always be found at least in the stomach or guts (which again does not happen).

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<sup>210</sup> By way of multiplication by the operation of its own or through the mediation of the faculty of foveatrice.

<sup>211</sup> "The Roman nurses used the word *lalla* to quiet their children, and feigned a deity called *Lallus*, whom they invoked on that occasion. The *lullaby*, or tune itself, was called by the same name." See JOHNSON, *Dictionary of the English Language*, vol. III, 1818, unpaginated, lemma "Lullaby".

<sup>212</sup> CHRISTIAAN VAN STEENEVELD was a city surgeon of Leiden. He studied at Leiden University in 1668. In 1697, he published a letter to BIDLOO on the stomach ulcer, titled *Dissertatio de ulcere verminoso*, in which he used and depicted some microscopical observations. See the review of this booklet in *Philosophical Transactions*, vol. 22, no. 263 (April 1700), p. 570.

<sup>213</sup> RUYSCH, *Observationum anatomico-chirurgicarum centuria*, p. 62.

<sup>214</sup> See Letter 42 [27] L-078 of 21 February 1679, addressed to NEHEMIAH GREW, secretary of the Royal Society. For reasons unknown, this letter was never delivered to the Royal Society. The manuscript was discovered in the London Public Record Office by Delft city archivist PETRA BEYDALS. See her article "Leeuwenhoeck-brief no.-27 en andere gegevens". See also: *Collected Letters*, vol. 2. This was the last letter that L. wrote before he began publishing his letters himself in Dutch and Latin. Because the letter was never published during L.'s lifetime, BIDLOO must have seen a copy that L. kept.

## ADDITIONAL LETTERS ...

Thirdly, even if they bored their way through the aforementioned parts, chyle or fluid as thin as chyle would have to flow out. Otherwise, if the fluid were thicker, one must discover the holes in those bowels. To inquire into the truth here, I squeezed and searched through the stomach and guts of a sheep that was troubled to the utmost by this disease, while they were warm, afterwards held them in warm water, filled them with warm water, then again poured warm brandy and finally mercury into the lowest part and then pressed and re-pressed them, viewed them, and treated them in all ways (imaginable by me), but I could not perceive the least openings in them. That they should crawl out of the duodenum, through the common gallway into the gallbladder and gall tubes, beget their young there, etc., conflicts so much with the known makeup and workings or use of these parts that I need to refute this.

The thoughts that you wrote on the 19<sup>th</sup> of January last<sup>215</sup>, about the drinking of canal water and preparation of food for human beings, namely that many animals (I mean water animals and their eggs) may thus get into the human body, please me very much. But I firmly believe that the water that is found in the cavity of the belly, as stated above, in human beings and beasts, oozes only from cracked, broken, or otherwise violated water vessels, but not leaking out of the holes that these animals make in the stomach or the guts. But I understand at the same time that these animals, though not present in the water vessels themselves, can break and violate the water vessels and their beginnings in the liver. It is to me a certain truth that the seed or the eggs of these as well as other animals (for this, see the 12<sup>th</sup> and 13<sup>th</sup> pages of the treatise by Mr. STEENEVELD<sup>216</sup>) can get with the chyle into the blood, with the blood into the liver (with regard to these animals in particular), and farther only into the gall ways and organs, stay there, procreate, and thus tear and break the adjacent parts.

First, they lodge neither in the blood-vessels in general nor in those of the liver in particular, as having nothing (I except in some measure the portal vein) in and through which they differ essentially from the general blood vessels. I say that they are not in the blood vessels because of their own continual, peculiar, and progressive movement as well as that of the blood and intermixed juices.

2<sup>nd</sup>, not in the water vessels, for the aforementioned reasons, their narrowness and their continuous discharge of fluid from a narrow to a wider place.

3<sup>rd</sup>, not in the nerves, because these are not hollow tube parts whose ends open out into the cavity of the gall tubes.

4<sup>th</sup>, not in and between the scabbard-like membrane clothing the portal vein and the gall tubes since it fits closely everywhere without a space between and also itself having no open tubes that continue to the gall pipes, in which alone these animals are found.

5<sup>th</sup>, again, not between and in the places where artery and vein make the glands in the form of a small spot by coming together after unlimited branch-making and moreover by the dividing of their trunks from larger into smaller branches. These places also being so small and eminently named for the transmission of blood as well as the separation of waters and suitable for the purpose of nutrition and moreover for continuous movement, it is not to be understood that they would be able to serve for the procreation of these little animals.

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<sup>215</sup> The closest letter in subject matter is L's Letter 160 [96] L-279 of 9 November 1695, addressed to JOHANN WILHELM VON PFALZ-NEUBURG. See *Collected Letters*, vol. 11. Apparently, BIDLOO refers to the lost Letter L-334 of 19 January 1698, in this volume.

<sup>216</sup> STEENEVELD, *Dissertatio de ulcere verminoso*, pp. 12-13.

6<sup>th</sup>, even less so in the membrane clothing the liver, or in the rein of the umbilical cord, already changed into a ligament, or in the system of sinews and membranes connecting the liver to the diaphragm. I therefore think I may conclude, according to reason and from my experience, that these animals can be produced, grow, and multiply their kind again only in the organs, tubes, and gathering places of the gall. As further evidence of this statement may serve the following.

Firstly, the consideration that the sperm, the spawn or eggs of these animals, carried by the blood into the organs of the gall along with the oily part of the chyle in the beast filled with them, can be fastened and rest there, the walls of those vessels always being covered with a slimy and slowly moving moisture. Add to this that the gall is not, like the blood, in continuous motion. Its ejecting vessel, after being conveyed a little way between the membranes of the guts, is closed with a circle of muscle fibres so that it may be now closed, now open, as required.

2<sup>nd</sup>: where these animals or their eggs are found, the gall vessels are set out in bosses, hard and changed in colour, the animals themselves, all hanging so firmly to the aforesaid thick gall that their little bodies, already decreased in size, are yet covered with them everywhere.

3<sup>rd</sup>: the fluid that is squeezed out of their mouth and navel is the same, only a little thinner than that in which they live and by some parts of which they are nourished. But what wonder? Every animal has its living place and food, in particular, as required by its makeup. Sea-fish die in fresh water, river-fish in salt water, a worm in the air, a bird on the ground, and so forth. What wonder is it (I then say) that this animal, now conveyed into the body of another animal, lives, grows, procreates, and is found only in its living place and with its foodstuff or such as suits it most, to wit, in the gall organs and in the gall itself. I therefore deem it a wholly groundless doctrine that in order to drive worms and other little animals out of people's bodies, one should give them only bitter medicines, for one always sees the contrary in some diseases caused by worms. An example is toothache: to cure this, by bringing honey, sugar, or other sweet stuff to the spoiled teeth, one pulls worms out of them and thus cures the disease.

Now to show that these animals as well as others in the liver and other places and parts of bodies are the causes of some diseases and the accompanying symptoms, people know in general that hardly any things can be named in which no animals are sometimes found. Those desiring a summary here should read the note by Mr. PHILIPPUS SACHS VON LEEUWENHEIMB and published by the German academy in its collection of noteworthy cases in the year 1670, on the 34<sup>th</sup> and following pages<sup>217</sup>. But, to be brief, people know in particular, I forebear talking about other creatures, that no such fluid or solid parts can be named in man (for ultimately our observations in and about other animals and substances ought to benefit man) in and about which the all-searching diligence for the last few years (one praises your example) has discovered no living animals.

I do not want to assert (as it conflicts with the truth) that one can always show that in all diseases, itchings, hair worm<sup>218</sup> and ringworm, ulcers, and tumours it is animals, and especially those here mentioned, that are the cause, for I know that from some pimples a substance is squeezed which resembles nothing more, yet no less, than a little worm. See

<sup>217</sup> PHILIPP JAKOB SACHS À LEUWENHEIMB (1627-1672) was a state physician in Breslau (today Wrocław). He became a member of the Academy Leopoldina in 1658. BIDLOO referred to his "Messis observationum microscopicarum variis authoribus collectarum" (The harvest of microscopical observations, collected by various authors), *Misc. Curiosa*, vol. 1 (1670), pp. 40-57.

<sup>218</sup> *Hair worm*, today called herpes.

here a note of cases and places where animalcules, worms, and other creatures have been found in human bodies by men of judgment and diligence, for if I were to put forward a collection of the nonsense that could be found on the subject, about the wonderful shape changing, procreation, and biting and boring force of these and other animals, I would fall short of time, your knowledge of these things, and my patience.

*Worms are then found in the head*, see the aforementioned German academy journals, first 10<sup>219</sup>, Year 2, Observation 147<sup>220</sup> and Year 3, Observation 414<sup>221</sup>; second [first] 10, in Year 9 and 10, Observation 50<sup>222</sup>.

*Forty maggots, discharged through the nostrils* by an old woman after she had suffered from a difficult migraine, are spoken of by P. BORELLUS in his writing on the seldom observed, both in the afterword and in the 19<sup>th</sup> and 39<sup>th</sup> observations<sup>223</sup>.

*A worm was found on the hard brain membranes*, thus reported FORESTUS in his 9<sup>th</sup> Letter, the 44<sup>th</sup> observation of the first Part<sup>224</sup>.

HILDANUS reported a similar thing in the first 100, the 16<sup>th</sup> of his observations<sup>225</sup>, as also a worm discharged through the nose, as above, the 8<sup>th</sup> observation<sup>226</sup>.

Our PECHLINUS made *worms of the eyes* known in his 2<sup>nd</sup> book, the 35<sup>th</sup> observation<sup>227</sup>.

How they were *expelled through the nose*, we read in FORESTUS, Book 21, Observation 26, Part 3<sup>228</sup>. The German academy journals, 2<sup>nd</sup> 10, the 3<sup>rd</sup> year, Observation

<sup>219</sup> BIDLOO wrote *1ste: 100*, first 100, but the Latin is *decuria*, group or set of ten (hereafter corrected). The *Misc. Curiosa*, the journal of the Academia Leopoldina, restarted the volume numbering every ten years.

<sup>220</sup> BIDLOO refers to HERTOD, “Vermes Capitis” (Head worms), *Misc. Curiosa*, vol. 2 (1671), pp. 231-232. JOHANN FERDINAND HERTODT VON TODTENFELD (1645–1724), latinized as HERTODII, was a German physician and writer. He became a member of the Academy Leopoldina in 1670.

<sup>221</sup> Printing error. The observations in *Misc. Curiosa*, vol. 3 (1673) stopped with no. 350.

<sup>222</sup> BIDLOO refers to SCHMID, “Observatio I: De Verme Capitis” (About head worms), *Misc. Curiosa*, vol. 9-10 (1680), pp. 127-131. JOHANNES SCHMID (1623 – 1690) was a physician in Danzig (today Gdańsk).

<sup>223</sup> BOREL, *Historiarum et observationum medico-physicarum*, p. 25: “Observatio XIX. Vermes in capite verbis curati” (Worms in the head cured) and p. 88: “Observatio XXXIX. Vermes, alios sibi similes, in corpore humano generantes” (Worms, and the like, produced in the human body). PIERRE BOREL (1620-1671), latinized as BORELLUS, was a French physician, chemist, and botanist.

<sup>224</sup> FOREEST, *Observationum (Opera omnia)*, Lib. IX, p. 296: “Obs. XLIV: De dolore capitis à stomachi vitio oborto, è vaporibus à crudis humoribus ad caput elatis” (Pain in the head from the vice of the stomach and from the vapors from raw fluids raised to the head). PIETER VAN FOREEST (1521-1597), latinized as FORESTUS, was a physician, born in Alkmaar and living in Delft. He was known as the “Dutch Hippocrates”.

<sup>225</sup> HILDANUS, *Aanmerkingen*, p. 29: “Zeer stinkenden etter, en eenige wonden omtrent het harde Herzen-vlies gevonden” (Very stinky pus, and some wounds found around the hard meninges).

<sup>226</sup> HILDANUS, *idem*, p. 20: “Een kint, na langduurige hoof-pijn, een worm deur de neus quijt werdende, is daar door genezen” (A child, after a long-lasting headache, losing a worm through the nose, is cured as a result).

<sup>227</sup> PECHLIN, *Observationum physico-medicarum*, p. 299: “Observatio XXXV. Vermiculi oculorum” (Eye worms). JOHANN NIKOLAUS PECHLIN (1644-1706) was the son of a Leiden vicar. After receiving his doctorate in 1667 for a thesis titled *De Apoplexia*, he went on a Grand Tour, visiting Padua, among others. PECHLIN became professor of medicine in Kiel (Germany) in 1678, and court physician and librarian to the Duke of Holstein-Gottorp in 1680. He became a member of the Academy Leopoldina in 1678.

99<sup>229</sup>; by TULP, Book 4, the 12<sup>th</sup> [11<sup>th</sup>] chapter<sup>230</sup>; P. BORELLUS the third 100, Observation 45<sup>231</sup>.

How many times *worms* are found *in the ears* is to be found in the aforesaid German academy notes, in Year 3 and 4, Observation 5<sup>232</sup>. In FORESTUS, the 21<sup>st</sup> book, the 26<sup>th</sup> Observation, in the 12<sup>th</sup> book, Observation 9<sup>233</sup>; PLINUS, the 20<sup>th</sup> book, 14<sup>th</sup> chapter<sup>234</sup>; J.B. MONTANUS, Observation 40<sup>235</sup>.

PECHLINUS, Book 2, Observation 36. Speaks of *toothache worms*<sup>236</sup>.

A series of cases of *worms of even the teeth* are found reported by the many times mentioned German academy. See Year 5, Observation 192<sup>237</sup>; Year 9 and 10, Observation 24<sup>238</sup> and 187<sup>239</sup>; in the Danish notes, the 5<sup>th</sup> part, the 108<sup>th</sup> observation<sup>240</sup>. LEEUWENHOEK described that worms are swimming in spittle<sup>241</sup>, and also, the German

<sup>228</sup> FOREEST, *Observationum (Opera omnia)*, p. 348: Lib. XXI, Observatio XXVI, “De puere octo annorum multos vermes deiciente” (Worms chased away from an eight-year-old boy).

<sup>229</sup> Printing error. Observation 99 in *Misc. Curiosa*, dec. 2, vol. 3 (1685), pp. 205-208, concerns the bloodstream and does not refer to worms or the nose.

<sup>230</sup> TULP, *Observationes Medicae*, p. 315: Lib. IV, Cap. XI, “Vermis narium” (The nose worm). NICOLAEUS TULP (1593-1674) was a Dutch surgeon and mayor of Amsterdam.

<sup>231</sup> BOREL, *Historiarum et observationum medico-physicarum*, p. 231: “Observatio XLV. Vermes nasicolae” (Nose worms).

<sup>232</sup> RAYGER, “Observatio V. Aurium Vermibus” (Ear worms), *Misc. Curiosa*, vol. 4-5 (1676), p. 7-8. CAROLUS [KARL] RAYGER (1641-1707) was a city doctor in Bratislava (then Hungary). He became a member of the Academy Leopoldina in 1694.

<sup>233</sup> FOREEST, *Observationum (Opera omnia)*, Lib. XII, p. 69: “Observatio IX: De dolore auris cum sanie post suppurationem & abscessum permanente, per modum consultationis, pro CHRISTOPHORO BOETHO” (On the pain of the ear with bleeding after suppuration and an abscess, by way of consultation, for CHRISTOPHER BOËTH).

<sup>234</sup> PLINIUS, *Historia mundi naturalis*, 1582, p. 303: “De mentastro, & menta, & pulegio, & nepeta, & de cumino” (The wild mint, and mints, and pennyroyal, and catnip, and the cumin). GAIUS PLINIUS SECUNDUS (AD 23/24-79), called PLINY THE ELDER, was a Roman naturalist and natural philosopher.

<sup>235</sup> GIOVANNI BATTISTA DA MONTE (1498-1551), latinized MONTANUS, was an Italian physician from Verona. See his *Consultationes medicae* (n.p., 1572), col. 100, consilium XXXIX: “Vermes exempti ex auribus” (Worms from the ears).

<sup>236</sup> PECHLIN, *Observationum physico-medicarum*, p. 301-304: “Observatio XXXVI. Vermis odontalgicus” (The toothache worm).

<sup>237</sup> CLAUDE, “Observatio CXCII, Vermis importunus & molestissimus dentis cavi inquilinus” (Important and intrusive worm in the dental cavity), *Misc. Curiosa*, dec. 2, vol. 5 (1687), pp. 383-385. GABRIEL CLAUDE (1633-1691) was a German physician and alchemist from Altenburg. He became a member of the Academy Leopoldina in 1677.

<sup>238</sup> PECHLIN, “Observatio XXIV, Vermis odontalgico” (The toothache worm). *Misc. Curiosa*, vol. 9-10 (1680), pp. 75-76.

<sup>239</sup> SCHULTZ, “Observatio CLXXXVII, De vermibus dentium” (The tooth worm), *Misc. Curiosa*, vol. 9-10 (1680), p. 433-435. GOTTFRIED SCHULTZ (1643-1698) was a physician, astronomer and population statistician from Breslau. He became a member of the Academy Leopoldina in 1676.

<sup>240</sup> JACOBÆUS, “De verme dentium” (The tooth worm), *Acta Medica & Philosophica Hafniensia*, vol. 5 (1680), p. 281. OLIGER JACOBÆUS (1650-1701), also known as HOLGER JACOBI, was a Danish physician and naturalist and professor of medicine, philosophy, history and geography at University of Copenhagen. In 1674, he visited L.

<sup>241</sup> LEEUWENHOEK, Letter 76 [39] L-135 of 17 September 1683, *Collected Letters*, vol. 4. See also *Phil. Trans.*, vol. 14, no. 159 (1684), pp. 568-574.

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academy in the 9<sup>th</sup> and 10<sup>th</sup> year, in the 130<sup>th</sup> observation<sup>242</sup>. Many others, HILDANUS saying in his first part, the 59<sup>th</sup> observation<sup>243</sup>, that a great many of them lodging in the gums were the cause of deaths.

*Worms come out of the backbone* according to the account of the Germans, see the 2<sup>nd</sup> year, the 10<sup>th</sup> [109<sup>th</sup>] observation<sup>244</sup>. PETRUS BORELLUS finds them on the back and calls them, after the place, *back-worms*, the 1<sup>st</sup> part, the 89<sup>th</sup> observation<sup>245</sup>. Not only worms, but *slugs* also are sometimes thrown from the body by vomiting; see as above, the German academy, 85<sup>th</sup> of the first part of the 3<sup>rd</sup> year<sup>246</sup>. An unlimited number of observations are found about *worms vomited out of the stomach*. For example, the German academy speaks of them in the 3<sup>rd</sup> year, the 258<sup>th</sup> in the same<sup>247</sup>, and the 4<sup>th</sup> year, Observation 38<sup>248</sup> and 80<sup>249</sup>, in the second part, the 4<sup>th</sup> year, Observation 39<sup>250</sup>; the 6<sup>th</sup> year, Observation 33<sup>251</sup>.

These worms, but white and longer, were treated by FORESTUS, in the 21<sup>st</sup> book, the 26<sup>th</sup> observation, and also in the same place that an old man had spat out 500, and another 300.

That *stomach nausea* is caused by worms is asserted by the physicians of Copenhagen in the 5<sup>th</sup> part of their notes, with the 34<sup>th</sup> observation<sup>252</sup>.

The German academy established that there are *worms* that bore through the *guts* without damage in their 5<sup>th</sup> year, the 45<sup>th</sup> observation<sup>253</sup>, also by BONETUS in his 3<sup>rd</sup> book

<sup>242</sup> DOLAEUS, "Observatio CXXX. Vermibus in saliva" (Worms in saliva), *Misc. Curiosa*, vol. 9-10 (1680), pp. 305-306. JOHANN DOLÄUS (1651-1707), Latinized DOLAEUS, was court physician, first to the Duke of Nassau, and later to the Landgrave of Hessen-Kassel. He became a member of the Academy Leopoldina in 1680.

<sup>243</sup> HILDANUS, *Aanmerkingen*, p. 66: "Een verrotting in 't tant-vleesch, door wormen veroorzaakt, waar op eindelijk de doot volcht" (A decay in the gums caused by worms, which is finally followed by death).

<sup>244</sup> PILAS, "Vermis ex spina dorsi" (Worms from the spine), *Misc. Curiosa*, vol. 2 (1671), p. 180. JOHANN PILAS was a German surgeon of the Holy Roman Emperor.

<sup>245</sup> BOREL, *Historiarum et observationum medico-physicarum*, p. 88: "Observatio LXXXIX. Vermes, alios tibi similes, in corpore humano generantes" (Worms, and similar creatures, generated in the human body).

<sup>246</sup> LEDEL, "Cochleis vomito rejectis" (Regurgitated snails), *Misc. Curiosa*, vol. 3 (1673), p. 141-142. SAMUEL LEDEL (1644-1717) was a physician and district physician in Grünberg, Germany, where he was responsible for disease control, forensics, and the supervision of medical personnel. He became a member of the Academy Leopoldina in 1684.

<sup>247</sup> SCHULTZ, "Verme vomitu ejecto" (Worms ejected by vomiting), *Misc. Curiosa*, vol. 3 (1673), p. 460-461.

<sup>248</sup> POZZIS, "Vermibus ventriculorum erodentibus" (Stomach worms and corrosives), *Misc. Curiosa*, vol. 4-5 (1676), p. 36. ANTON VON POZZI (†1667) was court physician of Holy Roman Emperor LEOPOLD.

<sup>249</sup> HAIN, "Vermibus & stomacho rejectis" (Worms rejected by the stomach), *Misc. Curiosa*, vol. 4-5 (1676), p. 68-69. JOHAN PATERSON HAIN (1615-1675) was a physician from Pieniny (Slovakia).

<sup>250</sup> POLIS, "Vermibus vomitu rejectis" (Vomited worms), *Misc. Curiosa*, dec. 2, vol. 4 (1686), p. 96-97. GOTTFRIED SAMUEL POLIS (1636-1700), latinized as POLISIUS, was a German physician, natural philosopher and court physician to Elector FRIEDRICH WILHELM OF BRANDENBURG. He became a member of the Academy Leopoldina in 1677.

<sup>251</sup> HANNEMANN, "Bulimus a vermibus" (Bulimia worms), *Misc. Curiosa*, dec. 2, vol. 6 (1688), p. 88. JOHANN LUDWIG HANNEMANN (1640-1724) was a German professor of medicine in Kiel, known for his opposition to Harvey's theory of blood circulation. He became a member of the Academy Leopoldina in 1680.

<sup>252</sup> BARTHOLIN, "XXXIV: Cardialgia ex vermibus" (Cardialgia [heartburn] and worms), *Acta Medica & Philosophica Hafniensia*, vol. 5 (1680), p. 118.

of the art of physick in the North, the 16<sup>th</sup> part and there the 12<sup>th</sup> observation<sup>254</sup>. That others again, boring through the said parts, cause death is mentioned by the same author in the 13<sup>th</sup> observation<sup>255</sup>.

HILDANUS makes mention of a whole boss or *clump of worms*, discharged after severe colic, in the first part, the 57<sup>th</sup> observation<sup>256</sup>; *a piece of a worm, 7 cubits long*<sup>257</sup>, discharged by a woman, 2<sup>nd</sup> part, the 73<sup>rd</sup> observation<sup>258</sup>.

FORESTUS instructs us that *worms* are driven out *from the navel* in his 7<sup>th</sup> book, Observation 35<sup>259</sup> and the observations of the first part. Further the Danish notes, in the Year 1673, Observation 74<sup>260</sup>, state that *pinworms are the cause of intestine obstruction*. For this, see also the 3<sup>rd</sup> part the 26<sup>th</sup> aphorism of HIPPOCRATES<sup>261</sup>.

*Worms* have sometimes been found *in a groin boss*, according to the testimony of the famous German academy; see in the 6<sup>th</sup> year in the 12<sup>th</sup> part, the 144<sup>th</sup> observation<sup>262</sup>.

These *animals* are found *in the lung*, the *rib membranes*, the *pericardium*, and other parts of the chest like this, as noted by the Danish authors in their 3<sup>rd</sup> part, the 56<sup>th</sup><sup>263</sup>, and by FORESTUS in his 21<sup>st</sup> book, the 26<sup>th</sup> observation in Part 3.

Indeed, even *the heart is not free from worms*; see here the 13<sup>th</sup> observation of the German academy in the 9 and 10<sup>th</sup> Year<sup>264</sup>.

JOH. RHODIUS describes that there are *worms in the veins*, the 6<sup>th</sup> observation<sup>265</sup>; he also discovered them in the groin branches, see Observation 61<sup>266</sup>.

<sup>253</sup> GRASS, “Vermes intestina innoxie perforantes” (Worms perforating intestines harmlessly), *Misc. Curiosa*, dec. 2, vol. (1687), p. 87. ERNST SIGISMUND GRASS was a physician from Jauer in Silesia. He became a member of the Academy Leopoldina in 1691.

<sup>254</sup> THÉOPHILE BONET (1620-1689), latinized as BONETUS, was a Swiss physician and anatomical pathologist. See his *Medicina septentrionalis collatitia* (Northern medicine), vol. 1, p. 629: “Vermes intestina antes, restituto aegro” (The intestinal worm, before the recovery of a patient).

<sup>255</sup> *Idem*, p. 629: “Vermes intestina perforantes, pereunte aegra” (The perforated intestinal worm lets the patient die).

<sup>256</sup> HILDANUS, *Aanmerkingen*, p. 65: “’t Colijk, door wormen veroorzaakt, genezen” (Colic caused by worms, cured).

<sup>257</sup> *Ellen*. A Dutch *el* was an old measure of length. In the Dutch Republic, an ell or cubit was ≈ 69.4 cm. So, seven cubit ≈ 4.85 meters.

<sup>258</sup> HILDANUS, *Aanmerkingen*, p. 205: Letter to JACOB GRAFTIUS “Van breede wormen” (About broad worms).

<sup>259</sup> FOREEST, *Observationum (Opera omnia)*, p. 232: Lib. VII, Observatio XXXV, “De febre maligna, cum fluxualui, vermibus, & cataphora” (Malignant fever [yellow fever], with flux, worms, and cataphora)..

<sup>260</sup> Printing error. In the *Acta Medica & Philosophica Hafniensia*, vol. 1 (1673), or in vol. 2 [for the year 1673] (1675), no Observation LXXIV can be found that refers to such a phenomenon.

<sup>261</sup> HIPPOCRATES OF KOS (460-370 BC), Greek physician. Aphorism 26: “To persons somewhat older, affections of the tonsils, incurvation of the spine at the vertebra next the occiput, asthma, calculus, round worms, ascarides, acrochordon, satyriasmus, struma, and other tubercles (phymata), but especially the aforesaid”. See: <http://classics.mit.edu/Hippocrates/aphorisms.3.iii.html>.

<sup>262</sup> SCHULTZ, “De vermibus vivis e bubone inguinali exe untibus” (About the worms that live in the swellings of the lymph nodes in the groin), *Misc. Curiosa*, vol. 6 (1677), p. 205. (*Bubone* is Neo-Latin for inflamed swellings of the lymph nodes).

<sup>263</sup> *Acta Medica & Philosophica Hafniensia*, vol. 3 (1677), p. 88-89: p. 88-89, C. BARTHOLIN, “LVI: Anatome verminosi” (The anatomy of worms). CASPAR BARTHOLIN the Younger (1655-1738) was a Danish anatomist and the son of THOMAS BARTHOLIN, the editor of the *Acta*. In 1674, CASPAR visited L.

<sup>264</sup> POLIS, “De vermibus in cordis ventriculis repertis” (About worms found in the ventricles), *Misc. Curiosa*, vol. 9-10 (1680), p. 50.

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PETRUS BORELLUS tells of little animals that, having the form of a whale, live in the blood. See his 4<sup>th</sup> observation in the 3<sup>rd</sup> part<sup>267</sup>.

FORESTUS, that feverish people will be filled with worms. See his 7<sup>th</sup> book, the 36<sup>th</sup> observation, the first part<sup>268</sup>.

KIRCHERUS states them to be the causes or instruments of the plague<sup>269</sup>.

RHODIUS makes mention of *an exceedingly big worm* and calls it the *cause of a lasting illness and death* in his Part 3, Observation 64<sup>270</sup>.

It was said before where HILDANUS and others found *worms* e.g. *in the gallbladder, the urinary bladder*, and elsewhere. But the German academy reports them in the kidneys; see Year 3, Observation 405<sup>271</sup>.

As most writers who work on the occurrences of the diseases propose observations about *the urine*, there are too many to name all who have found *worms* in it. Among all these it may suffice to name the German academy, Years 3 and 4 [Years 4 and 5], Observation 156<sup>272</sup>; Year 3, Observation 77<sup>273</sup>; Year 6, Observation 31<sup>274</sup>. PECHLINUS, Book 2, Observation 18<sup>275</sup>. The Danes in their Part 5, Observation 21<sup>276</sup>. BONETUS in his aforementioned book, Observation 33<sup>277</sup>. TULP, Book 2, Chapter 43<sup>278</sup>. See also the German academy under the word *Termites*<sup>279</sup>.

<sup>265</sup> Printing error. In RHODE, *Observationum medicinalium centuriae tres*, in the three observations numbered VI, no mention is made of any worms. JOHAN RHODE (1587-1659), latinized RHODIUS, was a Danish physician and botanist. Until 1631, he was the prefect of the botanical garden in Copenhagen. Later in life, he taught medicine in Padua.

<sup>266</sup> *Idem*, p. 153 [cent. III, obs. 61]: “Vermes in venis” (Worms in veins).

<sup>267</sup> BOREL, *Historiarum et observationum medico-physicarum*, p. 289: “Observatio IV. Insecta baleniformia in sanguine humano” (Insects in the form of a whale in the human blood).

<sup>268</sup> FOREEST, *Observationum (Opera omnia)*, p. 233: Lib. VII, Observatio XXXVI, “De febre quartana intermittente cum vermibus” (Quartan fever [malaria] ceasing with worms).

<sup>269</sup> KIRCHER, *Naturelijke en Geneeskonstige navorsching der Peste*. See chapter I: “De peste is een geesell en een schighte Gods den menschen wegens de zonden toegeschoten” (The plague is a scourge and a shame of God shot at men on account of sin). See also the “Voor-reden” (Preface) by the Dutch translator DE GRAAF who refers to KIRCHER’s “zeer getrouwe ondervindingen, die ... daar in te zamen loopen dat ... pest-buylen vol zijn van ontelb're, en zeer kleyne wormkens, welke niet te zien zijn, dan door hulpe van een vergrootglas” (very faithful experiences, which ... run together that ... plague bumps are full of innumerable and very small worms, which cannot be seen except through the aid of a magnifying glass).

<sup>270</sup> RHODE, *Observationum medicinalium centuriae tres*, p. 154: obs. 64, “Habitus corporis verminosus cum variolis & pustulis” (The condition of the wormy body with smallpox and pustules).

<sup>271</sup> Printing error. The observations in *Misc. Curiosa*, vol. 3 (1673) stop with number 350. BIDLOO probably refers to SCHULZ, “De vermibus in renibus” (Worms in the kidney), *Misc. Curiosa*, vol. 3 (1673), p. 471-473.

<sup>272</sup> SCHMID, “Observatio CLVI. De vermibus cum urina excretis” (Worms excreted with urine), *Misc. Curiosa*, vol. 4-5 (1676), p. 198-199.

<sup>273</sup> Printing error. None of the three observations no. 77 in the various decades of the *Misc. Curiosa* discusses this subject.

<sup>274</sup> HANNEMANN, “Observatio XXXI. De vermibus cum urina excretis” (Worms excreted with urine), *Misc. Curiosa*, dec. 2, vol. 6 (1688), p. 85.

<sup>275</sup> PECHLIN, *Observationum physico-mediarum*, p. 248: “Observatio XVIII. Pestis exanthemata & tumores” (The pest causes skin rash [exanthema] and tumors).

<sup>276</sup> BARTHOLIN, “Vermes cum urina” (Worms with urine), *Acta Medica & Philosophica Hafniensia*, vol. 5 (1680), p. 83.

<sup>277</sup> BIDLOO’s reference is not clear. There are several observations titled XXXIII in BONET, *Medicina septentrionalis collatitia* (Northern medicine).



BONETUS mentions *wormy blood* discharged with the urine in his Observation 34, Part 29 of Book 3; and also a little animal *of the shape of a little cod fish ejected alive with the urine* in Observation 35. Once more of *a worm expelled from the bladder by a nursing woman* in Observation 33<sup>280</sup>.

The *worms* are also present *in the womb*; see here Observation 7 of Years 9 and 10<sup>281</sup>, and Observation 24 of Year 8, Part 2<sup>282</sup>. In the *sheath of the womb*, they are found by FORESTUS, Book 21, Observation 37 in the Scholia<sup>283</sup>.

German academy mentions *worms in the legs, the ball sack, and a tumour and little bladder full of worms*, Years 3 and 4 [4 and 5], Observation 173 [174]<sup>284</sup>, and also Year 7, Observation 16<sup>285</sup>.

BORELLUS described them *in scabies and smallpox*, Observation 72<sup>286</sup>.

*In pimples, smallpox, and the whole condition of the body*: RHODIUS, Observation 64, Part 3.

*A wholly wormy man* (Ah! Were this disease somewhat rare!) is reported by the Danes in their notes, Part 3, Observation 11<sup>287</sup>.

HILDANUS shows severe symptoms caused by *mites*, Observation 96<sup>288</sup>, as does BONETUS in his last Observation, Part 35: a continual production of *worms, from childhood to a great age*<sup>289</sup>. Notes are found about *aged worms of different forms, big and small worms, and other*

<sup>278</sup> TULP, *Observationes Medicae*, p. 173: Libri II, caput XLII: "Caput lati lumbrici" (The head of a wide worm); caput XLIII: "Ischuria lunatic" [discusses the role of urine and the moon].

<sup>279</sup> *Index generalis & absolutissimus Dec. I & II. Ephemeridum Germanicarum Academiae Caesareo-Leopoldinae*. (Index of the first two decades of the *Misc. Curiosa*), [unpaginated], lemma "Termites".

<sup>280</sup> BONET, *Medicina septentrionalis collatitia* (Northern medicine), pp. 834-835: Cap. XXXIII-XXXV, "Vermes cum urina" (Worms and urine), a.o.

<sup>281</sup> SCHARFF, "Observatio VII. De vermibus uteri" (Worms in the womb), *Misc. Curiosa*, vol. 9-10 (1680), p. 44. BENJAMIN SCHARFF (1651- 1702), latinized SCHARFFIUS, was a German medical doctor and court physician to the Prince of von Schwarzburg-Sondershausen. He became a member of the Academy Leopoldina in 1677.

<sup>282</sup> LANZONI, "Observatio XXIV. De Verme ab utero" (Worms from the womb), *Misc. Curiosa*, dec. 2, vol. 8 (1690), p. 72-73. GIUSEPPE (also JOSEPH) LANZONI (1663-1730) was a physician from Ferrara (Italy). He became a member of the Academy Leopoldina in 1690.

<sup>283</sup> FOREEST, *Observationum (Opera omnia)*, p. 361: Lib. XXI. "Observatio XXXVII, "De vermibus ascaridibus dictis" (The Ascaris worm described).

<sup>284</sup> LACHMUND, "Observatio CLXXIV. De vermibus admirandis pedum, lumrorum ac scroti, in America" (Worms with strange curvature in the feet, loins, and scrotum, in America), *Misc. Curiosa*, vol. 4-5 (1676), p. 235. FRIEDRICH LACHMUND (1635-1676) was a German physician and zoologist from Hildesheim.

<sup>285</sup> WEPFER, "Observatio XVI. Ventriculi tumor verminosus cum folliculo" (Swelling of the stomach and the gallbladder through worms), *Misc. Curiosa*, dec. 2, vol. 7 (1689), p. 26. JOHANN JACOB WEPFER (1620-1695) was a Swiss pathologist and pharmacologist from Schaffhausen and medical consultant to various members of the German royalty. He was the first physician to hypothesize that the effects of a stroke were caused by bleeding in the brain.

<sup>286</sup> BOREL, *Historiarum et observationum medico-physicarum*, p. 168: "Observatio LXXII. Vermes in scabie & variolis" (Worms in scabies and smallpox).

<sup>287</sup> HANNEMANN, "XI: De Verminoso homine" (About a wormy man), *Acta Medica & Philosophica Hafniensia*, vol. 3 (1677), p. 20-21.

<sup>288</sup> In HILDANUS, *Aanmerkingen*, in all six parts, no Observation XCVI can be found mentioning mites, so in this reference BIDLOO is mistaken.

<sup>289</sup> BONET, *Medicina septentrionalis collatitia* (Northern medicine), p. 882: "Verminutio continua ab ipsa infantia in senectutem usque durans" (Worms still lingering continuously from infancy to old age).

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*animals* everywhere in all parts of the body. So then, now the difference, or rather the argument, will have to be whether these animals, that, one admits, are found in the parts of living human bodies, can or cannot be causes of diseases and their accompanying consequences, and all the more so, because among others TH. KERCKRING, a man who has acquired a great reputation in anatomy and medicine, doubts it when on 177<sup>th</sup> page in his Observation 93 he attempts to show the uncertainty of the judgements that one forms about things in anatomy through and by the help of magnifying glasses<sup>290</sup>. He deduces this uncertainty: 1. From the smallness of the centre of the view<sup>291</sup>; 2. From the change of colour; 3. From alternative views of the same parts, so that what now seems to be separate is really united, yes, joined together bodily. But after having highly praised a certain magnifying glass and its maker, B. SPINOZA<sup>292</sup>, he adds these words:

through the help of this my wonderful tool I saw very wonderful things, namely, that the guts, the liver, and all the tissue of the other intestines are filled with an endless number of very small little animals. Then anybody who considers that a house that became inhabited is clean and bright, but nevertheless wears away through the continual maintenance of those who inhabit it, will be able to doubt whether these little animals corrupt or undercut these parts through their continual movement?

Though I am not unacquainted with what a great influence, credence, and confidence the unfounded reputations of experience, example, and accounts of so-called matters of fact and so on have received and been retained not only among common folks, but unfortunately also among some visible persons, I will now oppose or cite no writers who deny or deduce that diseases and their symptoms are caused by worms and other animals in the human body. For, to say my opinion both free-heartedly and reverently, I mean that any experience, observation, and example will never come to pass, unless at best somewhat in general, never in particular.

First, one never sees two cases – what do I say cases? – one never sees two things all alike everywhere. On that maxim I once said – and it pleased some:

### ALL THINGS ARE DIVINE, BECAUSE OF THEIR INFINITE VARIETY

Applying this to the healing art, then in my thoughts, the time of year, age, sex of the patients, manner of living, place of the diseases, greater or lesser severity of the illness and the disease, and moreover, many other circumstances plead against the proportionality and applicability of one observation to another occurrence.

Secondly: one finds few people and even fewer physicians and surgeons who are willing to or dare to acknowledge their mistakes for the benefit of their neighbours.

Thirdly: if it happens, after reasonable inquiry, that one lights upon two very similar cases, then I ask (I think with good reason), does one reasonably conclude from this an irrefutable truth and consequent law that this always happens and always must be done first? I think not. Add to this:

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<sup>290</sup> THEODOR KERCKRING (1639-1693) was a Dutch anatomist and alchemist. See his *Spicilegium anatomicum*, 1670, p. 177: “Observatio XCIII. Per microscopia incertum in anatomia iudicium” (Through microscopic judgement of the anatomy uncertain).

<sup>291</sup> The middle part of the lens, which had the best resolution.

<sup>292</sup> BARUCH DE SPINOSA (1632-1677), the Dutch philosopher, also made microscopes and telescopes.

Fourthly: no one in the medical and surgical arts should still be allowed to go to witnesses. If this were done and everything for which witnesses could be found were true, so before long would all the miracles ever devised by the papists for adorning their booths be true. If this were done, one would have to assume a thousand follies to be true on the testimony and assurance of a frightened or ignorant person, and quacks would get prized above wise physicians and skillful surgeons.

Fifthly: What credence is there really to the account of things by which men, by their own account, obtain benefit or harm? What will many people, and certainly many physicians, not do for profit? To say (and yet to lie) *I have cured this one of deafness with this instrument and that one of the falling sickness with that medicine* goes well, until one seeks the cured people and finds them not at all or quite the contrary. Briefly, I keep to the rules of reason, using them as much as I can, serving my external senses and their remedies like a messenger to a letter, a tool to work, light to visibly distinguish things that are already different, and so on. And I firmly state that all diseases (I forbear talking of externally contributed damage) are to be found first in the liquid parts, secondly in the tubes through which the liquids flow, and thirdly in the parts to which they are conveyed. Moreover, more often than one thinks, animals are the cause of the bad condition of these three parts, their hindrance in movement, and the consequences of that. I quite expressly deny that the blood and the gall are or ever have been made or ordered as many describe them. Commonly these parts and substances have done it; commonly they and their bad condition are called the causes of diseases. First, there is too much or too little, now too salt, then too gluish, now too sour, then too watery, now too thick, then too thin. The second, too much or too little, too clammy or not clammy enough, too bitter or not duly bitter, now bound and mixed too closely with the blood, then not closely enough; now burnt, then not boiled enough. All this talk can pass, and why not? The *visit* gets finished, gets its *form*, and the quack *visitor* gets his money. Anyone who wants to see the portrait of such

EEN RAADSHEER MET EEN P, IN 'T MIDDEN, OF VOOR AAN,

(a counselor with a 'p', in the middle or in the front)

in a poem, should read the 7<sup>th</sup> character sketch of the Lord of ZUYLICHEM<sup>293</sup>, but should not mix among this multitude the brave and learned men who, keeping on the track

<sup>293</sup> CONSTANTIJN HUYGENS (1596-1687), Lord of Zuilichem, in Gelderland, was the owner of the castle there. With the phrase *een raadsheer met een P, in 't midden, of voor aan*, BIDLOO refers to a well-known poem by HUYGENS, published for the first time in 1625, in HUYGENS's first collection of poetry. In the fifth book of this volume, Huygens included a few character sketches. He was especially dismissive of the incompetent medical doctor:

EEN ONWETEN MEDICYN (An ignorant physician).

Hij is een onder-Beul; een Buffel met een' Rinck;

Een vuijst in't sweerigh oog; een Oorband op een' klinck;

Een Vroedvrouw met een baerd; een konstigh Menschen-moorder;

Een' dobbel kerckhoff-ploeg; een Boeren borsen-boorder;

**Een Raetseer met een' P. voor't midden of voor aen;**

Een' onbetrouwbaer' brugg daer elck will over gaen

En vallen in de gracht daer hij mochte treden,

Een' Zeissem van de Dood; een Bessem van de Steden:

Een onbegrijplick vat, dat min begrijpt dan't geeft;

Een mild-mond van een man die geeft en niet en heeft.

## ADDITIONAL LETTERS ...

of reason and duty, are pleasing to God and people because of their wisdom and honourable service bestowed in good faith on their suffering neighbours. They know from the form, the makeup, the movement, that the blood cannot be salt or sour, the gall not burnt, not watery, that the intermixing of other substances does not change any part of its essence. They do not seek causes of diseases in fluids and organs that are not or ever were in the places where people propose the beginning of the disease. They are able and willing to understand that little animals may bring diseases and damages to the person in whom they are present, even though they do not see them creeping out from the noses and ears of patients and dead bodies by the thousands and just fathoms and feet long and thick. Indeed, they will allow that, because one can find animals in all parts of the body, they also can cause and probably do cause disease in all parts of bodies.

I have ever and always found it takes more work to inquire into and become acquainted with diseases and their causes than, having found them, to cure or help them. Yes, what men many times state as the causes of something, I regard as their consequences and effects. Thus, people call a watery tumour in the belly, an ulcer in the lung or the liver, a boss in the groin, and so forth, when found in dead bodies, the causes of the disease and the death, without considering that they are the consequences of previously broken, stopped up, or otherwise damaged tubes and hindered movements of some fluids, and without inquiring whereby, in what place, when, and in what manner these happened or could have happened. Here it comes that for one and the same disease one person is seen using medicines full of volatile salt, another such as have an earthy and solid composition. But [I will] enlarge on this on another occasion, so not to go too far from the matter I am writing about. I certainly think that I have shown enough how some little animals get into the bodies of people. Now I imagine that the way in which they can damage, torment, and destroy them and thus be causes of diseases and their symptoms, yes, of death, is that these animals, which are sometimes found together in the thousands:

Firstly, stretch out beyond measure the parts in which they lodge, through the growth of their little bodies as well as through the increase of their kind.

2<sup>nd</sup>: by violating these parts by biting into and through them, these organs thus becoming useless in whole or in part.

3<sup>rd</sup>: by boring and squeezing into and through tubes and places whose tender system suffers from this.

4<sup>th</sup>: through heating of the saps, namely, when they hinder their passage and exit and are hurtful.

5<sup>th</sup>: by taking in for their nourishment and growth the fluids, saps, and substances that are regulated for the nourishment and growth or for the preparation and service of some parts.

6<sup>th</sup>: by casting their filth, eggs, young, and dead little bodies between and into the parts, whose movement is thus hindered, which brings bad consequences with itself.

There were more ways of causing damage, but I trust that these will be enough to give an idea of still others.

Now the person who knows and uses a remedy that, without harming the parts of the body, prevents these animals from gnawing, creeping, and whatever else is named above, kills them or casts them out while alive from the body, acts securely in this regard in his prescription and healing. But even if it be admitted that the disorders of the fluid parts and thus of the blood and mixed substances, whether the disorder were conceived to

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The Latin translation of Bidloo's letter includes the first five lines. See: C. HUYGENS, *Otiorum libri sex: Poëmata, varij sermonis, stili, argumenti*, Hagæ-Comitis: Arnoldi Meuris, 1625, vijfde boek ("Steden-Stemmen. Characteres oft Printen"), p. 32.

consist in their condition or their motion, can cause certain diseases and their symptoms, will it therefore be called unreasonable to prove that also animals, mixed with them and indeed found in the solid parts, can cause certain diseases and their symptoms? Of the first, more words can be produced, and of the second, more solid proofs. Therefore, it is fitting that the people who rely everywhere and only on their experiences should themselves be guided by the second to what they ought to seek first, to wit, the reason.

I would now speak further of the medicines demanded above in general and in particular [but] I fear I have already transgressed the law of discretion, the title of this treatise, and the bounds of a writing ordered for only one aim, indeed keeping Your Honour too long from your business with matters that do not properly belong to your studies by stretching the reasoning longer than a letter requires and adding other things about these little animals according to my experiences. But Your Honour, as well as anyone who may ever bother reading this writing, may well indicate that I have done this only for the benefit of medicine and as a spur to zealous inquirers into the still hidden knowledge of many matters, the number of which is truly unlimited. I will also, at the first opportunity, respectfully propose my thoughts concerning the tubes, called the trumpets of FALLOPIUS<sup>294</sup> and other parts situated close by, about which Your Honour do me the honour of writing<sup>295</sup>.

Leiden, the 21<sup>st</sup> March,  
in the year 1698.

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<i>Letter:</i>	<b>L-339 of early April 1698</b>
<i>Written by:</i>	JOHAN ARNOLDI.
<i>Manuscript:</i>	This letter is known only by reference in another letter.
<i>Summary:</i>	In this letter, ARNOLDI writes from Brussels that he had to spend a pistole to get to L. the book that ANTONIO MAGLIABECHI sent to L. the previous year. ARNOLDI leaves it to L. to decide whether to reimburse him.
<i>Sources:</i>	Letter 192 L-342 of 17 April 1698 to ANTONIO MAGLIABECHI.
<i>Remarks:</i>	For an overview of the exchange of letters between ARNOLDI and L. concerning MAGLIABECHI's gift, see the Remarks to ARNOLDI's first letter to L., Letter L-333 of 15 January 1698, in this volume.

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<sup>294</sup> Fallopian tubes. GABRIELE FALLOPPIO (1523-1562) was a Catholic priest and anatomist.

<sup>295</sup> BIDLOO refers to a letter from L. that has not survived, perhaps Letter L-334 of 19 January 1698 mentioned above. It is not known whether BIDLOO ever wrote the answer he promised here.

## ADDITIONAL LETTERS ...

<i>Letter:</i>	<b>L-340 of April 1698</b>
<i>Addressed to:</i>	JOHAN ARNOLDI
<i>Written by:</i>	ANTONI VAN LEEUWENHOEK.
<i>Manuscript:</i>	This letter is known only by reference in another letter.
<i>Summary:</i>	In reply to ARNOLDI's letter about compensation, L. writes that he will repay ARNOLDI's expenses related to getting ANTONIO MAGLIABECHI's present to L. if ARNOLDI will explain what it cost.
<i>Source:</i>	Letter 192 L-342 of 17 April 1698 to ANTONIO MAGLIABECHI.
<i>Remarks:</i>	For an overview of the exchange of letters between ARNOLDI and L., see the Remarks to ARNOLDI's first letter to L., Letter L-333 of 15 January 1698, in this volume.

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<i>Letter:</i>	<b>L-341 of early April 1698</b>
<i>Addressed to:</i>	HARMEN VAN ZOELLEN.
<i>Written by:</i>	ANTONI VAN LEEUWENHOEK.
<i>Manuscript:</i>	This letter is known only by reference in another letter to VAN ZOELLEN.
<i>Summary:</i>	In this letter, L. suggests that VAN ZOELLEN, based on earlier observations and common practice in Delft, should use plaster to whitewash wooden storage containers to prevent damage from worms.
<i>Source:</i>	Letter 199 [115] L-355 of 26 April 1699 to HARMEN VAN ZOELLEN.
<i>Remarks:</i>	<p>The present letter is the third of four known letters from L. to Rotterdam merchant and politician HARMEN VAN ZOELLEN (1625-1702). Letter 180 L-309 of the "latter part" of 1696 about what L. had learned from a trader from the East Indies is known only by the reference to it in Letter 199 [115] L-355 of 26 April 1699. Letter 196 [113] L-349 of 17 December 1698 contains excerpts from three letters that L. had written in 1677 and 1678 to refute HARTSOEKER's claim that he had been the first to examine sperm with a microscope. Letter 199 [115] L-355 is about the damage caused to mace by insects and their larvae, the chalking of wood to combat noxious white ants, and the biting and stinging of ants. All three letters to VAN ZOELLEN are in <i>Collected Letters</i>, vol. 12.</p> <p>According to other details in Letter 199 [115] L-355 of 26 April 1699, the present letter to VAN ZOELLEN was written around April 1698 ("about a year ago") when L., traveling to Utrecht, met a gentleman who owned nutmeg and mace farms in Banda with whom he discussed mace.</p>

Somewhat later ("since that time"), a visitor told L. about how pests were treated in the Indies. It is that information that L. passed on to VAN ZOELEN with the present letter.

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<i>Letter:</i>	<b>L-344 of June 1698</b>
<i>Written by:</i>	ANTONIO MAGLIABECHI.
<i>Manuscript:</i>	No manuscript is known.
<i>Published in:</i>	A. MAGLIABECHI, 1698: "Italiaansch Boeknieuws", <i>De Boekzaal van Europe</i> , September and October, pp. 374-378 – Dutch translation of an excerpt from the original Latin and Italian.
<i>Summary:</i>	In this letter, MAGLIABECHI tells L. that he should not reimburse the man in Brussels for delivering a book from MAGLIABECHI to L. MAGLIABECHI also reports on several recent books that he thought might be of interest to L. and the Dutch readers of RABUS's <i>Boekzaal</i> .
<i>Source:</i>	Letter 192 L-342 of 17 April 1698 to ANTONIO MAGLIABECHI.
<i>Remarks:</i>	RABUS regularly published excerpts from MAGLIABECHI's letters to L. This letter is the twelfth of the fourteen letters with book news published in thirteen <i>Boekzaal</i> articles from March 1693 to October 1699. What is known about the rest of this letter comes from L.'s Letter 194 L-346 of 14 August 1698 to ANTONIO MAGLIABECHI, <i>Collected Letters</i> , vol. 12:

The Reverend PAPENBROEK personally handed me Your very kind letter, Most Illustrious Sir, at the time when recently, during my stay at Antwerp, I was given an opportunity to enjoy his company and his most learned conversations. From this letter I see that You do not by any means advise me to reimburse the Man in question, who lives at Brussels, in any way for the expenses he says he has incurred in getting the book (with which you recently saw fit to make me happy).

Further, Most Illustrious Sir, I would urgently request You to take no further pains to inquire any more about the vicissitudes or events relating to the Book. Indeed, I quite realize, after due consideration of everything, that those to whom this matter had been entrusted have not acted very honestly and that not everything has happened in the way they allege; nor had this escaped my notice before the payment of a gold coin, which they call *Pistolet*, had been exacted from me through a Skipper (who at once brought a receipt from Brussels, in order that the payment should not be deferred).

Nevertheless, I yet paid that money, when claimed in this way, with the greatest pleasure, as do those who, in order to procure some treasure, spare no expenses, however great, to possess the thing they covet so much.

The man who lives in Brussels is JOHAN ARNOLDI. See the Remarks to Letter L-333 of 15 January 1698 from ARNOLDI to L., in this volume.

## ADDITIONAL LETTERS ...

MAGLIABECHI's previous letter to L. is Letter L-337 of March 1698, in this volume.

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<i>Letter:</i>	<b>L-345 of 9 June 1698</b>
<i>Written by:</i>	ROBERT HOOKE.
<i>Manuscript:</i>	No manuscript is known. On the unsigned copy of this English letter transcribed here is to be found in London, Royal Society, Letter Book Original 11B.114, p. 268, 1 p. Some of Hooke's original spelling and punctuation have probably been changed.
<i>Published in:</i>	Not published.
<i>Summary:</i>	In this letter, Hooke discusses L.'s recent letters and sending copies of L.'s missing numbers of <i>Philosophical Transactions</i> . He encourages L.'s continuing research.
<i>Remarks:</i>	This is the last known letter from HOOKE to L., who made no known response to it, indicating another lost letter. HOOKE's previous letter, sixteen years earlier, is Letter L-118 of 26 March 1682, in this volume. L. responded to that letter with Letter 68 [36] L-119 of 4 April 1682 about the muscles of lobsters and shrimp and the lost Letter 69 L-120 of 28 July 1682, both in <i>Collected Letters</i> , vol. 3. After that, the Society's other secretary, FRANCIS ASTON, took responsibility for corresponding with L. See the Remarks to Letter L-123 of 26 February 1683 from ASTON to L., in this volume.

*Text:*

London May 30, 1698

Sr.

The Royal Society have commanded me to thank you for your letter by D<sup>r</sup>. HARWOOD<sup>296</sup> and that wherein you describe the eyes of beetles &c<sup>297</sup>. They have ordered me to send you the Transactions you want<sup>298</sup> this very day which are sent you by Mr. PISOLAS, a

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<sup>296</sup> Attorney and Royal Society council member JOHN HARWOOD (1661–1731) was elected a member of the Royal Society on 3 November 1686. See BIRCH, *The History of the Royal Society of London*, vol. IV, p. 499.

<sup>297</sup> Letter 193 [111] L-343 of 9 May 1698, *Collected Letters*, vol. 12. It begins, "My last most obedient letter was that of the 10th of September of last year, which I remitted to Doctor HARWOOD, fellow member of the Royal Society."

<sup>298</sup> In a postscript to Letter 188 [110] L-329 of 10 September 1697, *Collected Letters*, vol. 12, L. writes, "Doctor HARWOOD has requested me to commit to paper what Philosophical Transactions have not been sent to me for the past few years. I therefore take the liberty to inform Your Honour that the Transactions Nos 186 to 195 inclusive and Nos 208 to 219 inclusive have not been sent to me."



member of the Society<sup>299</sup> now going to the Hague, who will take care to convey them to you. They are extremely pleased to hear from you and give credit to what you are pleased to impart unto them. They wish you may go on in your searches in several subjects, and pray your favour in communicating to them what you find extraordinary.

Yours

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<i>Letter:</i>	<b>L-348 of 27 November 1698</b>
<i>Written by:</i>	FORTUNATO VINACCESI.
<i>Manuscript:</i>	This letter is known only by reference in another source.
<i>Summary:</i>	VINACCESI writes to L., enclosing a letter sent from Parma to ANTONIO MAGLIABECHI about four experiments to protect gunpowder from the effects of water and fire. He also encloses letters on the same subject from Tuscany, Milan, and Turin.
<i>Source:</i>	<i>De Boekzaal van Europe</i> for January and February 1699, p. 185.
<i>Remarks:</i>	FORTUNATO NICOLA VINACCESI (1631-1713) was an Italian linguist who also constructed optical devices. This letter is his only known contact with L.

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<i>Letter:</i>	<b>L-350 of late 1698</b>
<i>Written by:</i>	ANTONIO MAGLIABECHI.
<i>Manuscript:</i>	No manuscript is known.
<i>Published in:</i>	A. MAGLIABECHI, 1699: "Italiaansch Nieuws", <i>De Boekzaal van Europe</i> , January and February, pp. 183-186. – Dutch translation of an excerpt from the original Latin and Italian.
<i>Summary:</i>	In this letter, MAGLIABECHI writes to praise L.'s work and express regret that the book he sent has not been received by L. He reports on several recent books that he thought might be of interest to L. and the Dutch readers of PIETER RABUS's <i>Boekzaal</i> . The books were written in Latin by some fellow Italians.
<i>Remarks:</i>	RABUS regularly published excerpts from MAGLIABECHI's letters to L. This letter is the thirteenth of the fourteen letters with book news published in thirteen <i>Boekzaal</i> articles from March 1693 to October 1699. What is known about the parts of the present letter not dealing with

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<sup>299</sup> Mr. PISOLAS is not identified. No one by this name is on the list of past fellows of the Royal Society.

## ADDITIONAL LETTERS ...

the books comes from L.'s Letter 198 L-354 of 28 February 1699 to ANTONIO MAGLIABECHI, *Collected Letters*, vol. 12:

I have received the letter which you, Very Noble and Learned Sir, have done me the honour to write, informing me at the same time that I shall receive the pistole which, as I was told, is the cost of the great present of the book which you sent me beyond my deserts. ... I am obliged to you for the great kindness you had by sending me the news from Italy; I was pleased to read in your letter that Mr. COOL<sup>300</sup> and his Companion are still there, in good health and careful study.

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<i>Letter:</i>	<b>L-351 of February 1699</b>
<i>Written by:</i>	JOHAN ARNOLDI.
<i>Manuscript:</i>	This letter is known only by reference in other letters.
<i>Summary:</i>	In this letter, JOHAN ARNOLDI writes that he has been reimbursed by Mr. COLOMBANUS for the pistolet he spent to get the book that ANTONIO MAGLIABECHI sent to L. as a gift. He is returning the pistolet that L. had earlier sent as reimbursement.
<i>Sources:</i>	Letter 194 L-346 of 14 August 1698 to ANTONIO MAGLIABECHI. Letter 198 L-354 of 28 February 1699 to ANTONIO MAGLIABECHI.
<i>Remarks:</i>	For an overview of the exchange of letters between ARNOLDI ("the man in question, who lives at Brussels") and L., see the Remarks for Letter L-333 of 15 January 1698 from JOHAN ARNOLDI, in this volume.

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<i>Letter:</i>	<b>L-353 of February 1699</b>
<i>Addressed to:</i>	JOHAN ARNOLDI.
<i>Written by:</i>	ANTONI VAN LEEUWENHOEK.
<i>Manuscript:</i>	This letter is known only by reference in another letter.
<i>Summary:</i>	In reply to ARNOLDI's letter explaining that he has been doubly compensated for the pistolet he spent to get ANTONIO MAGLIABECHI's gift to L., L. writes that ARNOLDI should repay him by boat.
<i>Source:</i>	Letter 198 L-354 of 28 February 1699 to ANTONIO MAGLIABECHI.
<i>Remarks:</i>	For an overview of the exchange of letters between ARNOLDI and L. concerning MAGLIABECHI's gift, see the Remarks to ARNOLDI's first letter to L., Letter L-333 of 15 January 1698, in this volume.

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<sup>300</sup> Mr. COOL is not identified.

- Letter:* **L-359 of 8 September 1699**
- Written by:* ANTONIO MAGLIABECHI.
- Manuscript:* No manuscript is known.
- Published in:* A. MAGLIABECHI, 1699: "Italiaansch Boeknieuws", *De Boekzaal van Europe*, September and October 1699, pp. 376-379. – Dutch translation of an excerpt from the original Latin and Italian.
- Summary:* In this excerpt from his letter, MAGLIABECHI reports on several recent books that he thought might be of interest to L. and the Dutch readers of RABUS's *Boekzaal*. The books were written in Latin by some fellow Italians. He also encloses a printed sheet describing a bag that would not break when gunpowder inside of it exploded.
- Remarks:* RABUS regularly published excerpts from MAGLIABECHI's letters to L. This letter is the last of the fourteen letters with book news published in thirteen *Boekzaal* articles from March 1693 to October 1699. MAGLIABECHI's next letter with book news, Letter L-381 of mid-1701 in this volume, was published in RABUS's new journal, the short-lived *Twee Maandlijke Uittreksels*.  
 What is known about the other parts of the letter comes from L.'s Letter 206 [121] L-363 of 16 October 1699 to ANTONIO MAGLIABECHI, *Collected Letters*, vol. 12:
- I have duly received Your Honour's very welcome and very courteous letter, which also dealt with the news about Italian books, and further the enclosed printed sheet describing the admirable invention of the bag in which gunpowder was enclosed and the force which this bag had resisted without breaking. I am most grateful for this undeserved communication.
- MAGLIABECHI's previous letter to L. is Letter L-350 of late 1698. His next letter is Letter L-381 of sometime before August 1701. Both are in this volume.

- Letter:* **L-374 of 15 July 1700**
- Written by:* HANS SLOANE.
- Manuscript:* This letter is known only by reference in L.'s reply.
- Summary:* In this letter, SLOANE writes to L. that he is forwarding three larvae from JOHN CHAMBERLAYNE that came from a decayed tooth, presumably CHAMBERLAYNE's. He also tells L. that the Royal Society is sending him a book.
- Source:* Letter 216 [130] L-375 of 27 July 1700 to HANS SLOANE.

## ADDITIONAL LETTERS ...

*Remarks:* At the meeting of the Royal Society on 10 July 1700, “Dr. SLOAN read a letter w<sup>ch</sup> he wrote to M<sup>r</sup> LEWENHOEK concerning the wormes taken from y<sup>e</sup> Teeth by UPTON the operator desiring his opinion of y<sup>m</sup> &c.” SLOANE is referring to the worms mentioned at the previous meeting on 4 July. “A Letter from Mr JOHN CHAMBERLAINE was read, giving an Acc<sup>t</sup>: of one UPTON an operator of Teeth who w<sup>th</sup> a tube made like a Trumpet & a small Candle w<sup>th</sup> which he brought small white wormes out of the Teeth; 2 of the wormes were likewise produced with the Letter by D<sup>r</sup> SLOAN.” See Sir HANS SLOANE’s secretarial minute books of Royal Society meetings, 1699-1702. Royal Society Manuscripts General, MS 557.2.3.

In the three years since SLOANE’s Letter L-321 of 17 May 1697, the only letter L. had received from London was ROBERT HOOKE’s Letter L-345 of 9 June 1698, both in this volume. The previous known letter from SLOANE to L. is Letter L-369 of 8 June 1700, *idem*, vol. 13, there unnumbered and dated 28 May 1700 O.S. Between that letter and the present letter, L. sent three letters to SLOANE, Letter 203 L-360 of 1 September 1699, *idem*, vol. 12 and Letter 207 [122] L-364 of 2 January 1700 and Letter 212 [127] L-370 of 14 June 1700, *idem*, vol. 13. SLOANE’s next letter to L. is Letter L-379 of 29 November 1700, in this volume.

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*Letter:* **L-379 of 29 November 1700**

*Written by:* HANS SLOANE.

*Manuscript:* This letter is known only by reference in L.’s reply.

*Summary:* In this letter, SLOANE writes courteously to L. that his recent letters are welcome to the Royal Society.

*Source:* Letter 220 [135] L-380 of 25 December 1700 to HANS SLOANE.

*Remarks:* The member of the Royal Society who brought the present letter to L. is not identified. In the source letter, L. wrote that he “had little time to stay with me, since he had been invited to dine that afternoon with a distinguished gentleman.”

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*Letter:* **L-381 of sometime before August 1701**

*Written by:* ANTONIO MAGLIABECHI.

*Manuscript:* This letter is known only by reference in another letter.

*Published in:* A. MAGLIABECHI, 1701: “Italiaansch Boeknieuws”, *Twee Maandelijke Uittreksels*, September and October 1701, pp. 935-939. – Dutch translation of an excerpt from the original Latin and Italian.

*Summary:* In this excerpt from his letter, MAGLIABECHI reports on several recent books that he thought might be of interest to L. and the Dutch readers of RABUS's *Twee Maandelijke Uittreksels*. The books were written in Latin by several fellow Italians.

*Remarks:* RABUS regularly published excerpts from MAGLIABECHI's letters to L. This letter is the only letter from MAGLIABECHI to L. published in the *Twee Maandelijke Uittreksels*, the successor to *De Boekzaal van Europe*. RABUS published only the book news.

In the previous issue of the *Twee Maandelijke Uittreksels*, for July and August 1701, p. 745, RABUS wrote, "XXVI. Italian Book News, from the most recent letters of Mr. ANTONIO MAGLIABECHI to Mr. ANTONI VAN LEEUWENHOEK, remains, for lack of space, until the next two months. National news comes first." (*'t Inlandsch gaat voor*).

L. does not refer to this letter from MAGLIABECHI in any of his own letters.

MAGLIABECHI may have been referring to this letter in another letter, dated 31 May 1701, to the Dutch scholar GISBERT CUPER<sup>301</sup>. In that letter he wrote:

*Le poche novità Letterarie di Italia, per non incomodarla senza proposito, poiché potrà vederle nella mia qui inclusa, al Signore Læuvenboek, che per tale effetto mando a V.S.Ill.ma senza sigillare. Quando con ogni sua comodità le avrà vedute, prego V.S.Ill.ma a degnarsi di farla sigillare, e fargliela avere.*

Freely translated:

For your convenience and without any other purpose, I send to Your Excellency without sealing, the few literary novelties from Italy, as I send them to MR LEEUWENHOEK. When you have examined this, at your leisure, I beg Your Excellency to condescend to have it sealed, and to send it to him. When, with all his convenience, he has seen them, I ask Your Excellency to deign to have it sealed and let him have it.

For other occasions when MAGLIABECHI sent someone an unsealed letter with book news addressed to L., see JACOB GRONOVIIUS's Letter L-179 of 11 July 1686 and MAGLIABECHI's Letter L-465 of 10 July 1708. Both are in this volume.

MAGLIABECHI's previous letter to L. is Letter L-359 of 8 September 1699, in this volume, to which L. replied with Letter 206 [121] L-363 of 16 October 1699, *Collected Letters*, vol. 12. He did not reply to the present letter. MAGLIABECHI's next letter to L. is Letter L-435 of sometime before March 1705, in this volume. For an overview of the exchange of letters between MAGLIABECHI and L., see Appendix 6, in this volume.

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<sup>301</sup> Letter of 31 May 1701 from MAGLIABECHI to CUPER, Den Haag, Koninklijke Bibliotheek, KW 72 D 10. GISBERT CUPER (1644-1716, also, GIJSBERT CUPER or GISBERTUS CUPERUS) was a Dutch historian and politician and after 1668 professor at the Athenaeum Illustre in Deventer.

## ADDITIONAL LETTERS ...

<i>Letter:</i>	<b>L-386 of 24 April 1701</b>
<i>Written by:</i>	JOHN CHAMBERLAYNE.
<i>Manuscript:</i>	This letter is known only by reference in L.'s reply.
<i>Summary:</i>	In this letter, CHAMBERLAYNE asks L. to explain why, when he was in Holland, the taste of water changed depending on how long it was boiled. He also asks whether L. has studied razors microscopically to explain why steel razors are spoiled by extreme heat and cold.
<i>Source:</i>	Letter 225 L-389 of 21 June 1701 to JOHN CHAMBERLAYNE.
<i>Remarks:</i>	<p>Translator JOHN CHAMBERLAYNE (1666-1723) studied at Leiden University in 1688 and was elected a fellow of the Royal Society in 1702. This letter begins the exchange between L. and CHAMBERLAYNE. Seven letters from L. to CHAMBERLAYNE are in <i>idem</i>, vol. 13-16.</p> <p>CHAMBERLAYNE addressed five known letters to L., the present letter of 24 April 1701 as well as Letter L-406 of 12 September 1702 about a friend's dental problems as well as his dental hygiene practices, Letter L-430 of 2 December 1704 about an odd piece of ash from a burned haystack, Letter L-450 of 31 March 1707 inquiring after L.'s health, and Letter L-469 of 13 August 1709, in which CHAMBERLAYNE again inquired about razors. All five of CHAMBERLAYNE's letters are in this volume.</p> <p>In addition, the Royal Society archives have record of several letters written by CHAMBERLAYNE to HANS SLOANE as editor of <i>Philosophical Transactions</i> about difficulties translating L.'s Dutch. For discussions of CHAMBERLAYNE's difficulties, see HENDERSON, "Making 'the good old man' speak English: the reception of Antoni van Leeuwenhoek's letters at the Royal Society, 1673-1723" and VERMIJ and PALM, "John Chamberlayne als vertaler van Antoni van Leeuwenhoek".</p>

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<i>Letter:</i>	<b>L-387 of 24 April 1701</b>
<i>Written by:</i>	HANS SLOANE.
<i>Manuscript:</i>	This letter is known only by reference in another letter.
<i>Summary:</i>	With this letter, SLOANE encloses a letter from JOHN CHAMBERLAYNE and introduces him to L. as the person who is now translating L.'s letters into English.
<i>Source:</i>	Letter 225 of 21 June 1701 to JOHN CHAMBERLAYNE.

<i>Letter:</i>	<b>L-388 of 20 May 1701</b>
<i>Written by:</i>	HANS SLOANE.
<i>Manuscript:</i>	This letter is known only by reference in L.'s replies.
<i>Summary:</i>	In this letter, SLOANE writes courteously to L. that his three recent letters are translated, read to the Royal Society, and published in <i>Philosophical Transactions</i> .
<i>Sources:</i>	Letter 226 [138] L-390 of 21 June 1701 to the Royal Society. Letter 227 [139] L-391 of 21 June 1701 to HANS SLOANE.
<i>Remarks:</i>	<p>The three letters L. refers to were all addressed to SLOANE and translated by JOHN CHAMBERLAYNE. Letter 219 [134] L-378 of 26 October 1700 was read at the meeting of the Royal Society on 27 November 1700 O.S.: "A Letter from Mr. LEWENHOEK to Dr. SLOAN dated Delft Oct:26:1700. Containing some observations of Insects on Fruit-Trees and their production &amp;c. The sketches were delliver'd to Mr. HUNT, And the Dr was desired to print this Curious letter in the Transactions."</p> <p>Letter 220 [135] L-380 of 25 December 1700 was read on 15 January 1701 O.S.: "A letter was read from Mr. LEEWENHOEK of the 25th. of Dec. 1700. Containing his observations on the animalcula in Semine Masculo. He was ordered the thanks of the society. The thanks of the society were ordered to be given Mr. CHAMBERLAIN for ye translation of this &amp; sevell. other of his letters."</p> <p>Letter 221 [136] L-382 of 28 January 1701 was read on 28 February 1701 O.S.: "A letter was read from Mr. LEEUWENHOEK wherein he gives an acct. of worms on willows &amp; cheese mites. He was ordered the thanks of the society." See Sir HANS SLOANE's secretarial minute books of Royal Society meetings, 1699-1702. Royal Society Manuscripts General, MS 557.2.3.</p> <p>All three letters were promptly published in <i>Philosophical Transactions</i>, vol. 22, nos. 266, 268, and 269, respectively, and are found in <i>Collected Letters</i>, vol. 13.</p>

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<i>Letter:</i>	<b>L-395 of 15 November 1701</b>
<i>Written by:</i>	JOHN SOMERS.
<i>Manuscript:</i>	No manuscript is known. The copy of the letter transcribed here is to be found in London, Royal Society, Letter Book Original 13.59, p. 186, 1 page.
<i>Published in:</i>	Not published.
<i>Summary:</i>	In this letter, SOMERS thanks L. for announcing that upon his death, he is bequeathing a cabinet with 26 of his microscopes to the Royal Society. He

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adds that so many of L.'s observations have been verified that the Society now accepts L.'s observations as "matters of fact".

*Remarks:* This letter was enclosed with the English Letter L-396 from HANS SLOANE of 18 November 1701, *Collected Letters*, vol. 14, there unnumbered, and dated 7 November 1701 O.S. SLOANE wrote,

The Society are extremely sensible of all your favours & more especially of this last of your intended legacy they desire their president my Lord SOMERS to return you their thanks for all your favours in a most particular manner which he has done by the enclosed letter. The society would not have troubled a person of his qualities had not they desired very heartily to show you the respect they bear you.

SLOANE was secretary of the Royal Society from 1693 to 1713 and editor of *Philosophical Transactions* from 1695 to 1713, volumes 19 through 28. During this time, he published excerpts from 64 letters by L., more than half of the total number of 114 letters published there.

Two decades after the present letter, Royal Society vice-president MARTIN FOLKES made a similar comment about accepting L.'s observations without verification in his account of L.'s bequest in *Philosophical Transactions*, Letter L-599, *Collected Letters*, vol. 19.

We have seen so many, and those of his [L.'s] most surprising discoveries, so perfectly confirmed, by great numbers of the most curious and judicious observers, that there can surely be no reason to distrust his accuracy in those others, which have not yet been so frequently or carefully examined.

L.'s reply to JOHN SOMERS (1651-1716) about chicken sperm is Letter 231 [142] L-398 of 6 December 1701, *ibidem*.

*Text:*

Lond. 4 Nov. 1701

Sir

Your obliging Letter of the Second of August last<sup>302</sup>, having been read by Doctor SLOANE to the Society on the 22<sup>d</sup> of Octob.<sup>303</sup> (which was the first time of their Meeting after it was receiv'd) they have commended me in their Name to Thank You for the very Valuable Legacy You are pleas'd to Design for them, of those Admirable Microscopes, by which you have made Discoveries of so many things of great Importance for the promoting of Natural Knowledge.

The Society does very affectionately & sincerely wish you may live long to make use of those Glasses, as you have done hitherto, with great Judgement & Success; but when at last they shall come to be possess'd of them, you may be assured They will preserve them with

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<sup>302</sup> Letter 228 [140] L-392 of 2 August 1701, *Collected Letters*, vol. 14.

<sup>303</sup> See Royal Society, Journal Book Original, vol. 10, p. 228.



the upmost Care<sup>304</sup>, not only on account of their real worth, but out of Respect to the Memory of so deserving a Member of their Body, and as an Evidence of your Esteem and Friendship for the Society.

I am also commanded to give you their Thanks for the many useful Observations you have frequently communicated to them, which they always receive with great pleasure. Such of them as have been Tried by any other of their Members have been so exactly verified by \*<sup>305</sup> Experiments, that the Society give an entire Credit to your relations of Matters of Fact<sup>306</sup>. They hope you will continue to transmit Accounts of what farther Progress you make in your Searches into Nature in the same kind Manner You have been accustom'd to do. They have directed me in their Name to assure you of their Friendship & Esteem: and I desire your leave to subscribe myself,

S<sup>r</sup>

Your most humble serv<sup>t</sup>

SOMERS President.

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<i>Letter:</i>	<b>L-402 of sometime before April 1702</b>
<i>Written by:</i>	HANS SLOANE.
<i>Manuscript:</i>	This letter is known only by reference in L.'s reply.
<i>Summary:</i>	In this letter, SLOANE writes an introduction to L. for JAMES VERNON to present when he visits L.
<i>Source:</i>	Letter 237 L-405 of 28 April 1702 to the Royal Society.
<i>Remarks:</i>	<p>This letter is the first of several with which SLOANE introduces someone who wants to visit L. In Letter 287 L-480 of 18 August 1711, <i>Collected Letters</i>, vol. 16, L. writes to JAMES PETIVER, an English visitor who was refused entrance to his house, "I would request you not to take it ill of me, since everyone who seeks to visit me is refused entrance unless he has a letter of recommendation." For references to other letters from SLOANE mentioning introductions, see Letter L-451 of 4 May 1707, introducing GILBERT BURNET, and Letter L-473 of late 1709, introducing ALEXANDER STUART. Both letters are to be found in this volume.</p> <p>For English politician JAMES VERNON (1646-1727), see Letter 237 L-405 of 28 April 1702, n. 1, <i>idem</i>, vol. 14, p. 141, and the Biog. Reg., <i>ibidem</i>, p. 371. This JAMES VERNON, however, is misidentified. L.'s visitor was his son, JAMES VERNON the younger (1677-1756), an English government official, diplomat, and politician who was educated at Utrecht and Rotterdam in the 1690s. He was elected a fellow of the Royal Society on 6 May 1702 and was an envoy to the Danish court from 1702 to 1707.</p>

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<sup>304</sup> By the early 19th century, the cabinet and its microscopes were lost. See FORD, "What were the missing Leeuwenhoek microscopes really like?" and ROBERTSON, "Van Leeuwenhoek microscopes—where are they now?"

<sup>305</sup> The asterisk is in the original; its meaning is unclear.

<sup>306</sup> See Remarks above.

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If he visited L. sometime in April while he was on his way to Denmark, perhaps he was not in attendance when the Royal Society elected him. The confusion perhaps comes from the *Dictionary of National Biography*, vol. 20, pp. 277-278, which discusses both father and son in the same article.

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*Letter:* **L-406 of 12 September 1702**

*Written by:* JOHN CHAMBERLAYNE.

*Manuscript:* This letter is known only by reference in L.'s reply.

*Summary:* In this letter, CHAMBERLAYNE describes in detail a friend's dental problems as well as his dental hygiene practices. He references L.'s Letter 98 [53] L-186 of 4 April 1687 about elephants' teeth. He encloses one of the teeth that fell out of his friend's mouth and asks L. not only to reply, but whether CHAMBERLAYNE can publish the reply for the benefit of mankind. He also asks a general question about what observations L. has published in the previous two years.

*Source:* Letter 238 L-407 of 8 December 1702 to JOHN CHAMBERLAYNE.

*Remarks:* The manuscript of L.'s reply, Letter 238 L-407 of 8 December 1702, *Collected Letters*, vol. 14, is lost; all that remains is CHAMBERLAYNE's translation (Royal Society, Early Letters L3.46).

L. mentions his "53<sup>rd</sup> letter", Letter 98 [53] L-186 of 4 April 1687, *idem*, vol. 6, to the Royal Society about elephants' teeth and toothaches. It was not published in *Philosophical Transactions*, so CHAMBERLAYNE read either the manuscript (Early Letters L2.8), the English translation (Early Letters L2.9) read aloud to the Royal Society in 6 April 1687 O.S., or L.'s publication of the letter in *Vervolg der Brieven* (1687) or in *Continuatio epistolarum* (1696).

The previous letter from CHAMBERLAYNE to L. is Letter L-386 of 24 April 1701, in this volume, to which L. replied with Letter 225 L-389 of 21 June 1701, *ibidem*, about salt crystals in rain-water and notches in a knife. He replied to the present letter with two letters. Letter 238 L-407 of 8 December 1702, *idem*, vol. 14, discusses dental hygiene and whether tea and coffee are harmful to teeth. Letter 251 L-427 of 3 October 1704, *idem*, vol. 15, discusses ashes of tobacco and the salt crystals from it. CHAMBERLAYNE's next letter is Letter L-430 of 2 December 1704, in this volume.

<i>Letter:</i>	<b>L-411 of sometime before November 1703</b>
<i>Written by:</i>	HANS SLOANE.
<i>Manuscript:</i>	This letter is known only by reference in L.'s reply.
<i>Summary:</i>	SLOANE writes a letter accompanying a book on silver mines that L. had requested as well as some numbers of <i>Philosophical Transactions</i>
<i>Source:</i>	Letter 242 L-412 of 3 November 1703 to HANS SLOANE.
<i>Remarks:</i>	<p>The book that L. received is ALVARO ALONSO BARBA's <i>Arte de los Metales, seguido de notas y suplementos al libro por un antiguo minero. Juicios y comentarios</i>, translated into English as <i>The art of metals in which is declared the manner of their generation and the concomitants of them</i>. L. had requested it in Letter 238 L-407 of 8 December 1702 to JOHN CHAMBERLAYNE, <i>Collected Letters</i>, vol. 14, after reading reviews of it in <i>Philosophical Transactions</i>, vol. 9, nos. 108 and 109 from 1674.</p> <p>L. had great interest in silver. In Letter 228 [140] L-392 of 2 August 1701 to the Royal Society, <i>Collected Letters</i>, vol. 14, L. describes the 26 microscopes he was bequeathing to the Society, "all of which have been ground by me and are in a silver setting and mounted with silver, most of them with the silver I extracted from mineral and separated from the gold with which it was contaminated." At the 1747 auction of L.'s microscopes, 170 of his simple single-lens microscopes were marked as made completely of silver and 3 of silver and brass. See REES, <i>Catalogus van het Vermaarde Cabinet van Vergrootglazen</i> (Catalogue of the renowned cabinet of magnifying glasses) and ZUIDERVAART &amp; ANDERSON, "Antony van Leeuwenhoek's microscopes". On L.'s death, he bequeathed to a relative two silver candlesticks that he had made himself. See BEYDALS, "Twee Testamenten".</p> <p>L. wrote often about silver. For the years close to the present letter, see Letter 167 [100] L-292 of 6 July 1696, <i>Collected Letters</i>, vol. 11, Letter 197 [114] L-352 of 1 February 1699, <i>idem</i>, vol. 12, Letter 240 L-409 of 5 February 1703, <i>idem</i>, vol. 14, and Letter 267 L-452 of 17 May 1707, <i>idem</i>, vol. 15.</p> <p>In the source letter, L. noted "your letters", by which he must have meant the present letter as well as the previous letter from SLOANE to L., Letter L-402 of sometime before April 1702, in this volume.</p>

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<i>Letter:</i>	<b>L-417 of 7 February 1704</b>
<i>Written by:</i>	SIEWERT CENTEN.
<i>Manuscript:</i>	This letter is known only by reference in another letter.
<i>Summary:</i>	After reading L.'s observations about how cochineal comes from an insect, Amsterdam merchant SIEWERT CENTEN wrote a seven-paragraph letter

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explaining why cochineal must come from a plant, not an insect.

*Source:* Letter 248 L-422 of 21 March 1704 to the Royal Society.

*Remarks:* According to the Remarks and footnotes to Letter 248 L-422 of 21 March 1704, *Collected Letters*, vol. 14, the copy of this letter in the University Library, Leiden, gives SIEWERT CENTEN (~1669-1720) as the name of the merchant that L. omitted here, as was his custom. CENTEN probably read L.'s letter about cochineal, Letter 105 [60] L-194 of 28 November 1687 to the Royal Society, *idem*, vol. 7, in Dutch in *Vervolg der Brieven*, published in 1687 by CORNELIS BOUTESTEYN in Leiden. If he read Latin, he could have read it in *Continuatio epistolarum*, published in 1689, also by BOUTESTEYN in Leiden.

The present letter initiates a brief exchange of letters, followed by L.'s reply, Letter L-419 of later in February, and CENTEN's response to that, Letter L-420 of late February or early March 1704, both in this volume.

The Mennonite CENTEN married JOHANNA BRUYN in 1695, and they had three children in the years before he wrote to L.

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*Letter:* **L-419 of mid-February 1704**

*Addressed to:* SIEWERT CENTEN.

*Written by:* ANTONI VAN LEEUWENHOEK.

*Manuscript:* This letter is known only by reference in another letter.

*Summary:* In this reply to a letter from SIEWERT CENTEN, L. sends "almost the whole of the aforesaid account, with the figures" of an article from *Philosophical Transactions* on cochineal and adds his own fresh observations, with figures, to refute CENTEN's claim that cochineal must be a plant, not an animal.

*Source:* Letter 248 L-422 of 21 March 1704 to the Royal Society.

*Remarks:* L. is replying to CENTEN's Letter L-417 of 7 February 1704, in this volume, in which CENTEN argues that cochineal comes from a plant. The "aforesaid account" and ten figures comprise most of the long Letter 248 L-422 of 21 March 1704, *Collected Letters*, vol. 14, in which L. re-examines cochineal to affirm that it comes from an insect. CENTEN's Letter L-420 of late February or early March 1704 reports on further observations that confirm his original claim in spite of L.'s evidence and reasoning. Both letters are in this volume.

*Letter:* **L-420 of late February, early March 1704**

*Written by:* SIEWERT CENTEN.

*Manuscript:* This letter is known only by reference in another letter.

*Summary:* In this response to L., CENTEN reports on his own further observations, which contradict L.'s conclusion that cochineal comes from an animal.

*Source:* Letter 248 L-422 of 21 March 1704 to the Royal Society.

*Remarks:* This is the last known letter between L. and CENTEN. Their correspondence began with CENTEN's Letter L-417 of 7 February 1704 and continued with L.'s reply, Letter L-419 of later that month, both in this volume.

*Letter:* **L-421 of sometime between March and July 1704**

*Written by:* HANS SLOANE.

*Manuscript:* This letter is known only by reference in L.'s reply.

*Summary:* In this letter, sent separately from a packet of seven numbers of *Philosophical Transactions*, SLOANE writes to L. that he is pleased with L.'s recent discoveries and he requests that L. continue his research.

*Source:* Letter 249 L-423 of 22 July 1704 to the Royal Society.

*Remarks:* *Philosophical Transactions* nos. 283-288 are found in vol. 23. No. 289, the first number in vol. 24, is dated 28 February 1704. Together, they contain seven letters by L. to the Royal Society, Letter 239 L-408 of 25 December 1702, Letter 240 L-409 of 5 February 1703, Letter 241 L-410 of 26 February 1703, Letter 243 L-413 of 3 November 1703, Letter 244 L-414 of 4 December 1703, Letter 245 L-415 of 8 January 1704, and Letter 246 L-416 of 1 February 1704, all in *Collected Letters*, vol. 14.

*Letter:* **L-424 of sometime before 4 September 1704**

*Addressed to:* PIETER HOTTON.

*Written by:* ANTONI VAN LEEUWENHOEK.

*Manuscript:* This letter is known only by reference in another letter.

*Summary:* In response to visitor HOTTON's question about the nature of the canals that raise the yellow sap in the common plant greater celandine, L. sends his observations.

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- Source:* Letter 250 L-426 of 16 September 1704 to the Royal Society.
- Remarks:* This letter and HOTTON's reply, Letter L-425 in this volume, constitute their only known exchange of letters. The dates of the letters are not specified in L.'s letter to the Royal Society, but they were probably written in August or early September 1704.
- PIETER HOTTON (1648-1709) was the professor of botany at Leiden University between PAUL HERMANN and HERMAN BOERHAAVE and had the year before been elected a member of the Royal Society.
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- Letter:* **L-425 of sometime between 4 and 16 September 1704**
- Written by:* PETER HOTTON.
- Manuscript:* This letter is known only by reference in another letter.
- Summary:* In this response to L., HOTTON follows up on their discussion of how sap moves within plants by sending an Indian fig, two different kinds of aloes, and a plant called "dragon's blood" (a red-veined dock).
- Source:* Letter 250 L-426 of 16 September 1704 to the Royal Society.
- Remarks:* For the letter from L. to which HOTTON is replying, see Letter L-424, in this volume. The dates of the letters exchanged between them are not specified in L.'s letter to the Royal Society, but they were probably written in August or early September 1704.
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- Letter:* **L-429 of 2 December 1704**
- Written by:* HANS SLOANE.
- Manuscript:* This letter is known only by reference in another letter.
- Summary:* In this letter, sent to L. along with a letter from JOHN CHAMBERLAYNE, HANS SLOANE writes that he is sending an interesting piece of ash for L. to examine.
- Source:* Letter 255 L-434 of 3 March 1705 to JOHN CHAMBERLAYNE.
- Remarks:* This letter follows up on L.'s Letter 251 L-427 of 3 October 1704 to CHAMBERLAYNE about tobacco ashes, *Collected Letters*, vol. 15. The "piece of the said matter" are ashes from a recent haystack fire in Salisbury, England, discussed in Letter 255 L-434 of 3 March 1705, *ibidem*. The letter from CHAMBERLAYNE it accompanied is Letter L-430 of 2 December 1704, in this volume.

<i>Letter:</i>	<b>L-430 of 2 December 1704</b>
<i>Written by:</i>	JOHN CHAMBERLAYNE.
<i>Manuscript:</i>	This letter is known only by reference in L.'s reply.
<i>Summary:</i>	In this letter, CHAMBERLAYNE replies that L.'s recent remarks on tobacco ash pleased him. He also relates that when having dinner with the archbishop of Canterbury and the bishop of Salisbury, he learned about a burned haystack, the ashes of which were a light solid substance. He gave a sample to HANS SLOANE, who enclosed it in a separate letter to L.
<i>Source:</i>	Letter 255 L-434 of 3 March 1705 to JOHN CHAMBERLAYNE.
<i>Remarks:</i>	<p>L. writes to CHAMBERLAYNE about tobacco ashes in Letter 251 L-427 of 3 October 1704, <i>Collected Letters</i>, vol. 15. The separate letter from HANS SLOANE is Letter L-429 of 2 December 1704, in this volume.</p> <p>THOMAS TENISON (1636-1715) was archbishop of Canterbury from 1694 until his death. GILBERT BURNET (1643-1715) was bishop of Salisbury from 1689 until his death. For BURNET, see the Remarks to Letter L-451 of 4 May 1707 from SLOANE to L., in this volume.</p> <p>The previous letter from CHAMBERLAYNE to L. is Letter L-406 of 12 September 1702, in this volume. Before CHAMBERLAYNE sent the present letter, L. replied with two letters, Letter 238 L-407 of 8 December 1702, <i>idem</i>, vol. 14, about dental hygiene and Letter 251 L-427 of 3 October 1704, <i>idem</i>, vol. 15 about tobacco ash and the salt crystals from it.</p> <p>L. replied to the present letter with Letter 255 L-434 of 3 March 1705, <i>ibidem</i>, about the vitrified matter in the sample that SLOANE had sent with Letter L-429 of 2 December 1704, in this volume.</p>

<i>Letter:</i>	<b>L-432 of 13 February 1705</b>
<i>Written by:</i>	HANS SLOANE.
<i>Manuscript:</i>	This letter is known only by reference in L.'s reply.
<i>Summary:</i>	In this letter, HANS SLOANE writes that L.'s recent letters are translated into English and read with great pleasure. He adds the Society's wishes that L. has a long and healthy life.
<i>Source:</i>	Letter 254 L-433 of 3 March 1705 to the Royal Society.
<i>Remarks:</i>	The letters that SLOANE refers to are Letter 252 L-428 of 4 November 1704 and Letter 253 L-431 of 13 December 1704, both in <i>Collected Letters</i> , vol. 15. They were translated by JOHN CHAMBERLAYNE and read at the meetings of the Royal Society on 6 December 1704 and 31 January 1705, after both of which L. "was ordered to be thanked", which resulted in the present letter from SLOANE. See Sir HANS SLOANE's secretarial minute

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books of Royal Society meetings, 1702-1707. Royal Society Manuscripts General, MS 557.2.4.

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- Letter:* **L-435 of early 1705**
- Written by:* ANTONIO MAGLIABECHI.
- Manuscript:* This letter is known only by reference in the English translation of a lost manuscript.
- Summary:* In this letter, MAGLIABECHI tells L. that he is sending a book and that he showed L.'s last letter about silver and diamonds to important religious and political people in Florence and Rome.
- Source:* Letter 267 L-452 of 17 May 1707 to JOHN CHAMBERLAYNE.
- Remarks:* The letter about silver dissolved in aqua fortis, Letter 256 L-435 of 12 March 1705, *Collected Letters*, vol. 15, is L.'s last known letter to MAGLIABECHI. Because L. generally responded promptly to MAGLIABECHI's letters, he was likely replying to a letter written to him early 1705.

It is not known what book MAGLIABECHI sent to L. It is possible that this letter is referred to by MAGLIABECHI in a letter to JACOB GRONOVIVS on 3 October 1704. At the end, MAGLIABECHI writes,

Included here, I send two of my letters to you begging you, reverently, for sure return. The one for Mr. LEEUWEHOEK, I send it to you but without sealing it, so that you can see the literary news. I sealed the other for Mr. BAYLE, because it contains the same literary novelties that I wrote to Mr. LEEUWEHOEK. Again I pray to you to deign to send these two letters of mine, to these two gentlemen, safely.<sup>307</sup>

After PIETER RABUS died in 1702, L. had nowhere to send MAGLIABECHI's book news for publication, so this book news has stopped.

PIERRE BAYLE (1647-1706) was a French philosopher, author, and lexicographer who lived and taught in Rotterdam after 1680. GRONOVIVS, living in Leiden, would have easily been able to forward both letters, if not deliver them personally.

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- Letter:* **L-440 of 10 November 1705**
- Written by:* HANS SLOANE (for the Royal Society).
- Manuscript:* This letter is known only by reference in other letters.

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<sup>307</sup> Ludwig Maximilians-Universiteit Munchen, Cod 4° Cod. Msc 777, f. 93.



- Summary:* In this letter, the Royal Society tells L. that several of his letters have been translated, printed in *Philosophical Transactions*, and sent to him.
- Sources:* Letter 261 L-442 of 29 December 1705 to the Royal Society.  
Letter 267 L-452 of 17 May 1707 to JOHN CHAMBERLAYNE.
- Remarks:* The letter was most likely written by HANS SLOANE as secretary of the Royal Society and editor of *Philosophical Transactions*. The text was discussed and approved during the meeting of the Royal Society of 31 October 1705 O.S. See Journal Book Original, vol. 11, p. 76, and Sir HANS SLOANE's secretarial minute books of Royal Society meetings, 1702-08, Royal Society, Manuscripts General, MS 557.2.4.  
The numbers of *Philosophical Transactions* that the Royal Society sent, numbers 290 through 300, are all in vol. 24. They contain 11 letters written by L., Letter 248 L-422 of 21 March 1704 through Letter 259 L-439 of 25 May 1705, in *Philosophical Transactions* numbers 292 through 298. The only exception is Letter 256 L-436 of 12 March 1705, which was published in vol. 25, no. 311. SLOANE edited both volumes and JOHN CHAMBERLAYNE translated all 11 of the letters. Letter 248 L-422 is in *Collected Letters*, vol. 14, and the others are all in *idem*, vol. 15.  
The previous letter from the Royal Society to L. is Letter L-284 of 17 February 1696. The next letter from the Royal Society to L. is Letter L-453 of 3 June 1707. Both letters were probably written by SLOANE.

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- Letter:* **L-443 of late December 1705 or early January 1706**
- Written by:* FRANCESCO CORNARO.
- Manuscript:* This letter is known only by reference in another letter.
- Summary:* In this thank-you letter, CORNARO tells L. that he is satisfied by L.'s long letter about pearls.
- Source:* Letter 267 L-452 of 17 May 1707 to JOHN CHAMBERLAYNE.
- Remarks:* The Italian diplomat FRANCESCO CORNARO (1670-1734; also CORNAR) visited L. sometime between early September to mid-November 1705 while he waited for a favourable wind for the crossing to England, where he would assume his post as envoy to the British court. He could have sent another lost letter to L. along with the coats of arms.  
L.'s letter to CORNARO about pearls is Letter 260 L-441 of 18 December 1705, *Collected Letters*, vol. 15, and CORNARO's thank-you letter was written presumably shortly thereafter. This is the only known correspondence between them.

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<i>Letter:</i>	<b>L-445 of 12 March 1706</b>
<i>Written by:</i>	GOVERT BIDLOO.
<i>Manuscript:</i>	This letter is known only by reference in another letter.
<i>Summary:</i>	With this letter, BIDLOO sends L. “two disputes” on the formation of chyle in the intestines.
<i>Source:</i>	Letter 264 L-447 of 20 April 1706 to the Royal Society.
<i>Remarks:</i>	<p>GOVERT BIDLOO (1649-1713), professor of medicine at Leiden University after 1694, had shortly thereafter begun visiting L. and writing to him.</p> <p>L. refers here to “two disputes”, but at the time, PIETER EVERTSE, from Middelburg in Zeeland, had written only his dissertation on the formation of chyle in the intestines, <i>Memoria demonstrationis organi chylicationis ... sub praesidio ... Godefridi Bidloo [...] omni controversia, liberare conabitur opponentium excepturus argumenta publice PETRUS EVERTZE, Medioburg-Zeland</i> (Lugduni Batavorum, apud Abraham Elsevier, 1706).</p>

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<i>Letter:</i>	<b>L-450 of 31 March 1707</b>
<i>Written by:</i>	JOHN CHAMBERLAYNE.
<i>Manuscript:</i>	This letter is known only by reference in L.’s reply.
<i>Summary:</i>	In this letter delivered by his nephew, CHAMBERLAYNE inquires after L.’s health, especially because for such a long time the Royal Society has not heard from L. about his health.
<i>Source:</i>	Letter 267 L-452 of 17 May 1707 to JOHN CHAMBERLAYNE.
<i>Remarks:</i>	CHAMBERLAYNE’s nephew is not identified.

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<i>Letter:</i>	<b>L-451 of 4 May 1707</b>
<i>Written by:</i>	HANS SLOANE.
<i>Manuscript:</i>	This letter is known only by reference in L.’s reply.
<i>Summary:</i>	In this letter, HANS SLOANE writes to introduce a visitor, GILBERT BURNET, traveling with his brother and their sons. He also notes that L. has not written to the Royal Society for a long time.
<i>Source:</i>	Letter 269 L-455 of 12 July 1707 to the Royal Society.

*Remarks:* Because L. received it “from the hands” of BURNET, SLOANE’s letter was probably a letter of introduction. GILBERT BURNET (1643-1715), a Scottish philosopher and historian, had been bishop of Salisbury since 1689. He was elected a fellow of the Royal Society in 1664. On 7 July 1707, he visited L. along with his brother THOMAS (1632?-1715?), the personal physician of Queen ANNE.

According to Leiden University’s *Album Studiosorum* (Album of students), on 2 August 1707, the BURNET brothers’ sons WILLIAM BURNET, age 20, GILBERT BURNET, 17, and THOMAS BURNET, 14, matriculated at the university, the first two to study theology and the youngest to study law. Young WILLIAM was already a fellow of the Royal Society and the other two would also go on to become fellows.

The time gap that SLOANE refers to is the 11 months that had passed since L.’s Letter 265 L-448 of 1 June 1706, *Collected Letters*, vol. 15. Not since SLOANE became editor, beginning with volume 19 of *Philosophical Transactions* in 1695, had such a long time passed without a letter from L. reaching London.

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*Letter:* **L-453 of 3 June 1707**

*Written by:* HANS SLOANE (for the Royal Society).

*Manuscript:* This letter is known only by reference in L.’s reply.

*Summary:* In this letter, the Royal Society accounts for L.’s recent letters and assures him that letters from him are always welcome and that the most recent, written to JOHN CHAMBERLAYNE, have been translated, printed in *Philosophical Transactions*, and sent to L.

*Source:* Letter 268 L-454 of 5 July 1707 to the Royal Society.

*Remarks:* The letter was most likely written by HANS SLOANE as second secretary of the Society and editor of *Philosophical Transactions*. The letters that L. refers to as having written to CHAMBERLAYNE all begin “Very Noble Sirs, Gentlemen of the Royal Society in London”.

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*Letter:* **L-456 of 15 July 1707**

*Written by:* ANGELUS VAN WIKHUYSEN.

*Manuscript:* This letter is known only by reference in another letter.

*Summary:* In this letter, VAN WIKHUYSEN writes in response to L.’s study of China Chinae that in his experience, contrary to the experience of others, its use as medicine does not cause greater problems than the problem it is used to treat.

## ADDITIONAL LETTERS ...

*Source:* Letter 270 L-457 of 25 July 1707 to the Royal Society.

*Remarks:* ANGELUS VAN WIKHUYSEN (1656- after 1714), a doctor from Zeeland, visited L. frequently. Most of their correspondence is lost. L.'s only known letter to VAN WIKHUYSEN is Letter 266 L-449 of 1707, *Collected Letters*, vol. 15. The previous letter from VAN WIKHUYSEN to L. is Letter L-259 of sometime before July 1695, in this volume.

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*Letter:* **L-460 of 4 November 1707**

*Written by:* HANS SLOANE (for the Royal Society).

*Manuscript:* This letter is known only by reference in L.'s reply.

*Summary:* In this letter, the Royal Society tells L. that two recent letters, written to FRANCESCO CORNARO and ANTONIO MAGLIABECHI, will be printed and that the figures that should have accompanied an earlier letter are missing. Also enclosed is part of a hairy substance for L. to investigate that the Society had received from "a learned gentleman".

*Source:* Letter 273 L-461 of 22 November 1707 to the Royal Society.

*Remarks:* The letter was most likely written by HANS SLOANE as second secretary of the Society and editor of *Philosophical Transactions*. The letters that L. refers to as having been written to Venetian envoy FRANCESCO CORNARO (also CORNAR), Letter 260 L-441 of 18 December 1705, and Florentine librarian ANTONIO MAGLIABECHI, Letter 256 L-436 of 12 March 1705, *Collected Letters*, vol. 15, were both published in *Philosophical Transactions*, vol. 25, no. 311. They are discussed in the Remarks and n. 2 to Letter 273 L-461 of 22 November 1707, *Collected Letters*, vol. 16. For the "learned gentleman", JAMES YONGE (1647-1721), see the Remarks to that letter.

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*Letter:* **L-465 of 10 July 1708**

*Written by:* ANTONIO MAGLIABECHI.

*Manuscript:* This letter is known only by reference in another source.

*Summary:* In this letter, MAGLIABECHI sends L. some book news.

*Source:* Letter of 10 July 1708 from MAGLIABECHI to JACOB GRONOVIVS, Ludwig Maximilians-Universität München, Cod 4° Cod. Msc 777, f. 117.

*Remarks:* This letter is the last known letter that MAGLIABECHI sent to L., although the date of his letter to GRONOVIVS may be after the date of the referenced letter to L. MAGLIABECHI may have sent a separate copy to

GRONOVIVS, but it is more likely that he asked GRONOVIVS to deliver the open letter to L., as he had done before. For other occasions when MAGLIABECHI sent someone an unsealed letter full of book news addressed to L., see L.'s Letter L-179 of 11 July 1686 to JACOB GRONOVIVS and MAGLIABECHI's Letter L-381 to L. of mid-1701. Both letters are in this volume.

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<i>Letter:</i>	<b>L-466 of sometime before 28 August 1708</b>
<i>Written by:</i>	HANS SLOANE (for the Royal Society).
<i>Manuscript:</i>	This letter is known only by reference in L.'s reply.
<i>Summary:</i>	In this letter, the Royal Society tells L. that recent letters have been received with pleasure and read to the attentive members.
<i>Source:</i>	Letter 277 L-467 of 28 August 1708 to the Royal Society.
<i>Remarks:</i>	The letter was most likely written by HANS SLOANE as second secretary of the Society and editor of <i>Philosophical Transactions</i> . The recent letters include three that L. wrote to the Society that were read aloud at meetings. Letter 274 L-462 of 6 December 1707, about an ox's and a hog's tongue, was read on 4 and 11 February 1707/8 O.S. Letter 275 L-463 of December 1707 or early 1708, about his experiments with red coral, was read on 3 March 1707/8 O.S. Letter 276 L-464 of 29 June 1708, about the white substance on his own tongue, was read on 27 October 1708 O.S. See Sir HANS SLOANE's secretarial minute books of Royal Society meetings, 1707-1711, Royal Society Manuscripts General, MS 557.2.5. All three letters were published in <i>Philosophical Transactions</i> , vol. 26, nos. 315, 316, and 318 and all are to be found in <i>Collected Letters</i> , vol. 16. These numbers were delivered to L. by ALEXANDER STUART on 2 January 1710. See Letter L-473 from HANS SLOANE of late 1709, in this volume.

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<i>Letter:</i>	<b>L-469 of 13 August 1709</b>
<i>Written by:</i>	JOHN CHAMBERLAYNE.
<i>Manuscript:</i>	This letter is known only by reference in L.'s reply.
<i>Summary:</i>	In this letter, CHAMBERLAYNE inquires again about razors and the effects of cold weather on their performance.
<i>Source:</i>	Letter 280 L-471 of 10 September 1709 to JOHN CHAMBERLAYNE.
<i>Remarks:</i>	In his first letter to L., Letter L-386 of 24 April 1701, in this volume, translator JOHN CHAMBERLAYNE (1666-1723) also inquired about the

## ADDITIONAL LETTERS ...

effects of extreme heat and cold on razors. The previous letter from CHAMBERLAYNE to L. is Letter L-450 of 31 March 1707, in this volume. L. replied to it with Letter 267 L-452 of 17 May 1707, *Collected Letters*, vol. 15, about bezoar stone and several unanswered letters.

The present letter is the last known letter from CHAMBERLAYNE to L., who replied to it with Letter 280 L-471 of 10 September 1709 about razors and Letter 281 L-472 of 22 November 1709 about head and facial hair and the muscle of a cod. Both letters are in *idem*, vol. 16.

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<i>Letter:</i>	<b>L-473 of late 1709</b>
<i>Written by:</i>	HANS SLOANE.
<i>Manuscript:</i>	This letter is known only by reference in L.'s reply.
<i>Summary:</i>	In this letter, HANS SLOANE writes to introduce a visitor, ALEXANDER STUART, as a curious world traveler.
<i>Source:</i>	Letter 282 L-474 of 14 January 1710 to the Royal Society.
<i>Remarks:</i>	<p>Because STUART visited L. on 2 January 1710, SLOANE's letter of introduction would have been written in late 1709. See his letter to SLOANE of 4 January 1710, British Library, Sloane MS 4042, fol. 83.</p> <p>The numbers of <i>Philosophical Transactions</i> that STUART brought to L. were no. 315 of 1 June 1708 through no. 320 of 1 April 1709, all in volume 26. They contain excerpts from L.'s Letter 274 L-462 of 6 December 1707, Letter 275 L-463 of 1 January 1708, Letter 276 L-464 of 29 June 1708, Letter 277 L-467 of 28 August 1708, and Letter 278 L-458 of 9 October 1708, all in <i>Collected Letters</i>, vol. 16.</p> <p>STUART was a natural philosopher and physician from Aberdeen, Scotland. From 1708 to 1711, he studied medicine at Leiden University. After graduating from college, he traveled the world as a ship's surgeon, corresponding with HANS SLOANE and publishing several articles in <i>Philosophical Transactions</i>. In 1712, he was elected a fellow of the Royal Society. STUART was one of the first visitors to view blood circulation through the newly developed eel viewer (<i>aalkijker</i>) that L. described later in Letter 282 L-474 of 14 January 1710, <i>Collected Letters</i>, vol. 16.</p>

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<i>Letter:</i>	<b>L-478 of 13 August 1709</b>
<i>Written by:</i>	JAMES PETTIVER.
<i>Manuscript:</i>	This letter is known only by reference in another letter.
<i>Summary:</i>	In this letter, JAMES PETTIVER complains that he had come to visit L. but was not allowed inside.

- Source:* Letter 280 L-471 of 10 September 1709 to JOHN CHAMBERLAYNE.
- Remarks:* This letter is the only known letter to L. from the English apothecary, botanist, entomologist, and Royal Society member JAMES PETIVER (ca. 1665-1718). The date is New Style on the assumption that PETIVER would have written it shortly after his attempted visit while he was still in Holland, where he matriculated at Leiden University on 28 July 1711 when he was 45 years old. However, JARVIS and COULTON's "Chronology of the Life" notes that PETIVER "visits the Netherlands (his only trip overseas) in June–July [1711] to purchase material from the collections of the late PAUL HERMANN (1645–1695) on behalf of Sir HANS SLOANE". See also DOBELL, *Little Animals*, p. 78, n. 4.
- Before PAUL HERMANN was director of the Hortus Botanicus at Leiden University, he spent five years as a doctor in Sri Lanka with the Dutch East India Company. There, he collected almost two thousand specimens that are now among the botanical collections at the Natural History Museum in London.
- For other letters concerning letters of recommendation, see Letter L-451 of 4 May 1707 introducing GILBERT BURNET and Letter L-473 of late 1709 introducing ALEXANDER STUART. Both letters were written by Royal Society secretary and *Philosophical Transactions* editor HANS SLOANE and both are found in this volume.

- Letter:* **L-491 of sometime a few years before 1713**
- Addressed to:* JAN MEERMAN.
- Written by:* ANTONI VAN LEEUWENHOEK.
- Manuscript:* This letter is known only by reference in a later letter to MEERMAN.
- Summary:* In this letter, L. writes to MEERMAN about how barley is filling, but provides little nourishment. He also writes about a membrane in the barley.
- Source:* Letter 298 [III] L-492 of 28 February 1713 to JAN MEERMAN.
- Remarks:* L. writes about barley most recently in Letter 200 [116] L-356 of 9 June 1699 to the Royal Society, *Collected Letters*, vol. 12. That letter was not published in *Philosophical Transactions*, so MEERMAN most likely read it when L. published it in 1702 in *Sevende Vervolg der Brieven*. Prior to that, the two letters that examine barley in detail are both addressed to the Royal Society: Letter 100 [55] L-188 of 13 June 1687, *Collected Letters*, vol. 6, and Letter 109 [64] L-199 of 24 August 1688, *idem*, vol. 7. In none of them does he discuss barley's ability to provide nourishment.

## ADDITIONAL LETTERS ...

This is the first of three known letters that L. wrote to JAN FRANS MEERMAN (1659-1738). MEERMAN lived on the Oude Delft in L.'s neighborhood on Delft's west side. They worked together in Delft's Stadhuis (city hall) from 1678, when MEERMAN joined the Veertigraad (city council), until he retired at age 70 in 1714. From 1687 to 1691, MEERMAN was a magistrate, so he would have interacted with L. often.

The other two letters from L. to MEERMAN were written while MEERMAN was one of Delft's mayors: Letter 298 [III] L-492 of 28 February 1713 and Letter 299 [IV] L-493 of 14 March 1714, both in L.'s *Send-Brieven* and in *Collected Letters*, vol. 17.

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<i>Letter:</i>	<b>L-498 of 13 August 1709</b>
<i>Written by:</i>	ANTONI CINK.
<i>Manuscript:</i>	This letter is known only by reference in L.'s reply.
<i>Summary:</i>	In this excerpt from a letter, ANTONI CINK tells GERARD VAN LOON that he has read in the works of ATHANASIUS KIRCHER that the sage plant is covered with webs and poisons people who eat them. He asks VAN LOON to ask L. to examine sage leaves with his magnifying glasses.
<i>Source:</i>	Letter 305 [IX] L-501 of 24 October 1713 to ANTONI CINK.
<i>Remarks:</i>	<p>The letter that VAN LOON forwarded to L. was sent to him by ANTONI CINK (1668-1742), professor at the university in Louvain, which is why L. replied directly to CINK. In Letter 305 [IX] L-501 of 24 October 1713, <i>Collected Letters</i>, vol. 17, L. refutes KIRCHER's ideas. L. wrote another letter to CINK, Letter 314 [XVI] L-516 of 26 March 1715, <i>ibidem</i>, about the structure and action of muscle fibres and tendons from the leg of a mouse before CINK responded with Letter L-517 of 2 July 1715, in this volume, thanking him. L. promptly responded with Letter 315 [XVII] L-518 of 7 July 1715, <i>ibidem</i>, another discussion of muscles and tendons.</p> <p>The following spring, CINK and two other professors at Louvain presented L. with an honorary medal accompanied by the laudatory Letter L-534 of 24 May 1716, <i>idem</i>, vol. 18. L. would write another two letters to CINK. Letter L-536 [XXV] discusses plant germination and saltpetre, as well as another rejection of spontaneous generation. In his final Letter L-553 [XXXVIII] of 6 July 1717, L. tells CINK about how two doctors treated his recent illnesses. Both doctors gave him saltpetre, and one mixed it with opium. Both of these letters are in L.'s <i>Send-Brieven</i> and in <i>Collected Letters</i>, vol. 18. There is no known reply from CINK.</p>



The book by ATHANASIUS KIRCHER (1602-1680) is *D'Onder-aardse Weereld in Haar Goddelijk Maaksel en wonderbare uitwerkselen aller Dingen* (The subterranean world in her divine structure and the wondrous effects of all things), published in 1682 in a Dutch translation from the Latin *Mundus subterraneus* (Subterranean world). L. had already refuted KIRCHER's ideas in Letter 126 [76] L-228 of 15 October 1693 and Letter 129 [77] L-231 of 20 December, 1693, both to the Royal Society, *Collected Letters*, vol. 9, and Letter 164 [98] L-285 of 20 February 1696 to FREDERIK ADRIAAN VAN REEDE, *idem*, vol. 11.

For CINK and GERARD VAN LOON (1683-1758), brewer, lawyer, historian and numismatist from Delft, see Letter L-536 [XXV] of 12 June 1716, *idem*, vol. 18.

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<i>Letter:</i>	<b>L-500 of 24 October 1713</b>
<i>Written by:</i>	HANS SLOANE.
<i>Manuscript:</i>	The manuscript is to be found in London, Royal Society, Early Letters S2.17, 1 p. A copy of the letter is to be found in London, Royal Society, Letter Book Original 15.14, pp. 22-23.
<i>Published in:</i>	Not published.
<i>Summary:</i>	In this letter, HANS SLOANE acknowledges the receipt of L.'s latest letter, reassuring him that the Society appreciates his correspondence. He believes that <i>Philosophical Transactions</i> were sent to him.
<i>Remarks:</i>	<p>According to a note in the Royal Society's Early Letters, this letter of 13 October 1713 O.S. by SLOANE was read at the meeting of the Royal Society on 22 October 1713 O.S. However, it had to have arrived in Delft before L sent Letter L-499 of 12 October 1713 to SLOANE, <i>Collected Letters</i>, vol. 17.</p> <p>SLOANE's previous letter to L. is Letter L-473 of late 1709, in this volume. The present letter is SLOANE's final letter to L. On 30 November 1713, he was replaced as second secretary and <i>Philosophical Transactions</i> editor by EDMOND HALLEY, who neither corresponded with L. nor published any of his letters. Instead, first secretary RICHARD WALLER wrote the next letter from the Royal Society to L., Letter L-502 of 3 March 1714 and four others later that year, all in this volume, but he died that winter. Communication with L. ceased until JAMES JURIN was elected to replace HALLEY on 30 November 1721 and wrote his first letter to L. on 5 March 1722, Letter L-571, <i>Collected Letters</i>, vol. 19.</p>

## ADDITIONAL LETTERS ...

*Text:*

Oct 13, 1713

Your Letter to the Royal Society dated the 28<sup>th</sup> of June last<sup>308</sup> came soon after to their hands and was delivered to M<sup>r</sup>. CHAMBERLAINE<sup>309</sup> of whom the Society desired the favour to translate it into English. He sent it to me a few days since & shall lay it before the Society some time hence when they shall begin to meet<sup>310</sup>. I would not have troubled you with this till I had rec<sup>d</sup>. the Commands of the Society had not I observ'd by yours that you have not rec<sup>d</sup>. the thanks for the Society for four of your former Letters<sup>311</sup> whereas they have ordered you their thanks every time you have sent them your observations w<sup>ch</sup>. will appear by the minutes of the Assemblies in which they were read<sup>312</sup> & I do assure you I have not only rec<sup>d</sup>. such directions but wrote to you such Letters as directed; M<sup>r</sup>. HUNT<sup>313</sup> was also commanded by the Society to send you the last year's Transactions<sup>314</sup> which I am very Confident I remember he did by some person going to Holland, who desired to carry them to you. 'Tis very likely some of the letters and this parcel of transactions have not been delivered. If you have not yet received them lett me know what numbers you have & I will supply you with these already printed & that are now printing, and, because M<sup>r</sup>. HUNT who knew how to direct to you such parcells is dead, tell me how to send to you. Please also to send a Copy of yo<sup>r</sup>. letter to the Heer ANTONY HEINSIUS<sup>315</sup>, & it, as also your other Letters will be gratefull to the Society &

Your most obedient  
Servant

HANS SLOANE.

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<sup>308</sup> Letter 302 [VII] L-496 of 28 June 1713, *Collected Letters*, vol. 17.

<sup>309</sup> For JOHN CHAMBERLAYNE (1668-1723), see VERMIJ & PALM, "Chamberlayne".

<sup>310</sup> The letter was read at the 22 October 1713 O.S. meeting of the Royal Society.

<sup>311</sup> Letter 288 L-481 of 22 September 1711, Letter 292 L-485 of 1 March 1712, Letter 293 L-486 of 12 April 1712, and Letter 294 L-487 of 10 June 1712, *Collected Letters*, vol. 16.

<sup>312</sup> The Royal Society's Journal Book Original, volume 11, has the minutes for only six meetings from 1702-1714, not including the minutes for the meetings SLOANE refers to here.

<sup>313</sup> For HENRY HUNT († 1713), operator of the Society, see the Biog. Reg., *Collected Letters*, vol. 13, p. 389.

<sup>314</sup> SLOANE must have meant volume 27 "For the Years 1710, 1711 and 1712." L. had six letters published in that volume.

<sup>315</sup> L. did so immediately. Letter 296 [I] L-489 to HEINSIUS was published in number 339 of volume 29 of *Philosophical Transactions*, dated 30 June 1714, when L. was 81 years old. Editor SLOANE dated it 12 October 1713, the day that L. sent it to SLOANE under a cover letter (Letter 304 L-499), not 8 November 1712, its original date. In 1718, L. published that letter, with the 8 November 1712 date, as Letter I in *Send-Brieven*.

- Letter:* **L-502 of 3 March 1714**
- Written by:* RICHARD WALLER.
- Manuscript:* The manuscript is to be found in London, Royal Society, Early Letters W3.80, 1 p. In the copy found in London, Letter Book Original 15.28, p. 36, some of the spelling and punctuation, seems to have been altered.
- Published in:* Not published.
- Summary:* In this letter, WALLER resumes writing to L. 20 years after his previous letter. He discusses L.'s recent letter about muscles and adds his own thoughts about muscles in insects.
- Remarks:* The copy, presumably of the letter as it was sent to L., differs at many points from the original manuscript, as noted in the footnotes below. At the end of the manuscript is the note, in WALLER's hand, "Draught of a letter for Mr Leuwenhoek read Feb. the 25<sup>th</sup> & ordered to be sent to him." In SHUCKARD, *Catalogues of the miscellaneous manuscripts* (1840), this letter, item 3821 on p. 162, is erroneously dated 24 February.
- WALLER and L. exchanged 11 letters in the early 1690s while WALLER was editor of *Philosophical Transactions*, volumes 17 and 18. WALLER initiated the exchange with Letter L-215 of 12 February 1692, *Collected Letters*, vol. 8, there unnumbered and dated 2 February 1692, in which he comments on L.'s observations in recent letters. See the improved translation of Letter L-215 in this volume. For an overview of the correspondence between WALLER and L., see Appendix 7, in this volume.
- The present letter from WALLER, twenty years later, begins a series of four letters from WALLER to L. over the following six months, ending with Letter L-508 of 30 August 1714, several months before WALLER's death. WALLER probably also wrote a fifth letter, Letter L-503 of 8 March 1714, from the Royal Society. All five letters are in this volume. His letters dealt with the business of *Philosophical Transactions* and Royal Society meetings. He also repeatedly encouraged L.'s study of muscles and asked him to focus especially on insects' muscles.
- L.'s previous and final letter to WALLER is Letter 139 [84] L-245 of 14 September 1694, *Collected Letters*, vol. 10. L. did not address another letter to the Royal Society or any of its officers until Letter 169 [102] L-295 of 10 July 1696, *idem*, vol. 11. Even though L. did not reply directly to WALLER, he wrote four letters to the Royal Society in those months, all about muscle fibers in a variety of mammals, birds, rodents, and insects: Letter 306 [X] L-504 of 22 June 1714, Letter 307 [XI] L-507 of 21 August 1714, Letter 308 [XII] L-509 of 26 October 1714, and Letter 310 [XIV] L-512 of 9 November 1714. After that, L. did not write another letter to the Royal Society until mid-1717. These letters are all in L.'s *Send-Brieven* and in *Collected Letters*, vol. 17. None of them was published in *Philosophical Transactions* because EDMOND HALLEY was its editor. For RICHARD WALLER (ca. 1650-1715), see LYONS, "Waller".

## ADDITIONAL LETTERS ...

*Text:*

A letter to Mr ANTHONY VAN LEUWENHOECK.

20 February 1713/4

S<sup>r</sup>.

It is now near 20 years since I had the happyness either of writing or receiving a letter<sup>316</sup> from you. But the Royall Society having received y<sup>rs</sup> of y<sup>e</sup> \_\_\_\_\_<sup>317</sup>, ordered me<sup>318</sup> to return you an answer, with their thanks for your communications, which opportunity of shewing my respect I readily embraced being very desirous of renewing my correspondence with a Person so valuable for the many happy discoverys you have made in Natural Subjects by your excellent Microscopes: and upon that account<sup>319</sup> so much respected by the Royal Society<sup>320</sup>.

Muscular motion, is a subject which has employed the Thoughts and Pens of several learned and inquisitive Naturallists: I need not mention Dr CROON, STENO, BORELLI<sup>321</sup> and others sufficiently known, by whome many observations and experiments have bin made and Hypotheses framed in order to explain the Mechanisme of so curious an Engine as a Muscle is, to which enquiry you your selfe have not a little contributed. By y<sup>r</sup> microscopical Observations of the texture of y<sup>e</sup> minute parts and compounding fibres of a Muscle both in flesh and fish are that of several kinds: yet I may say y<sup>t</sup> the subject not so far exhausted; but that there still remains enough to gratify the curiosity of the Inquirer<sup>322</sup>.

S<sup>r</sup> your last letter concerning the minute fibrillae of y<sup>e</sup> muscles of a whale compared with those of smaller animalls is curious; seeming to prove that the greater strength of the muscles, of those larg animals, does not proceed from the minute or least fibrilla of those muscles being larger; than they are in comparatively lesser animals but from there being a

<sup>316</sup> *of writing or receiving a letter*, in copy, to write or receive a Letter.

<sup>317</sup> The date is missing in both the manuscript and the copy. L.'s previous letter to the Royal Society is Letter 302 [VII] L-496 of 28 June 1713, *Collected Letters*, vol. 17. Read at a meeting of the Royal Society on 22 October 1713 O.S., the letter discusses little animals on duckweed plants and in dental plaque from L.'s mouth. The letter WALLER refers to here is Letter 304 L-499 of 12 October 1713 to HANS SLOANE, which is a cover letter for a copy of L.'s Letter 296 [I] L-489 of 8 November 1612 to ANTHONIE HEINSIUS that SLOANE had asked L. to send to him. That letter was read on 4 February 1714 O.S. and extracted in *Philosophical Transactions*, vol. 29, no. 339. See Letter L-500 to SLOANE of 24 October 1713, in this volume.

<sup>318</sup> *But the Royall Society having received y<sup>rs</sup> of y<sup>e</sup> \_\_\_\_\_, ordered me*, in copy, But the Royal Society having received yours of the \_\_\_\_\_, I was ordered.

<sup>319</sup> The copy omits *upon that account*.

<sup>320</sup> *by the Royal Society*, in the copy, by the Society as yourself.

<sup>321</sup> NICOLAS STENO (1638-1686), *New Structure of the Muscles and Heart and Specimen of Elements of Myology*. WILLIAM CROONE (1633-1684), *On the reason of the movement of the muscles*. GIOVANNI ALFONSO BORELLI (1608-1679), *On the Movement of Animals*. The original publications were all in Latin, so it is unlikely that L. read them; however, he may well have been familiar with them through discussions with friends who could read Latin.

<sup>322</sup> In the copy, this paragraph reads, Muscular motion is a Subject which has exercized the minds and Pens of several Learned and Inquisitive Naturallists, such as STENO D<sup>r</sup>. CROONE, BORELLI and many others as you well know by whome many observations were made in order to explain the Mechanisme of so curious and Engine to which Inquiry you have contributed Early, by your microscopical discoverys, you have gratify'd the world with the Texture of the minute parts and compounding fibres of a muscle both in flesh and fish of several kinds; nor is the Subject so far exhausted but there still remains Enough to Satisfy the curiosity of y<sup>e</sup> Inquirer.

greater congeries collection or number of them bound up together, in the same external membrane or tegument encompassing the whole body of y<sup>e</sup> muscle. As a large cable has its greater strength from the numerousness of the fibres of the hemp which compose it, tho' each particular fibre has the same size and texture of its parts and strength as it has in a small thred, of hemp<sup>323</sup>.

How far this may answer in Animals comparatively large in respect of Insects<sup>324</sup>, such as Whales<sup>325</sup> Oxen sheep and possibly mice, I doubt not nor in the least question your observations; But I presume to<sup>326</sup> offer it as my own thoughts, that I apprehend<sup>327</sup>, it must be otherwys in respect of Insects, especially the smaller those living Atomes, such as Mites & the like<sup>328</sup> whose minute limbs seeme to require a more fine and delicate texture of their little muscles, which in themselves are scarce visible at least<sup>329</sup> to the naked eye. and therefore these<sup>330</sup> seem to require a more delicate texture in the fibres of the muscles of such slender limbs<sup>331</sup>. the same may be judged<sup>332</sup> of their Tendons, artery's veins nerves and of the fluids<sup>333</sup> passing thro them. How far your diligence and Microscopes may<sup>334</sup> be able to carry on this Inquiry, the Royal<sup>335</sup> Society would with satisfaction be informed of, if your your<sup>336</sup> other occasions permit.

S<sup>r</sup> What ever other Discoverys your own Inclination, genius or opportunitys may lead you to attempt and make<sup>337</sup> will be always gratefully received by us:

The Transactions herewith sent you by the Society's order<sup>338</sup> will inform you of some of the Matters that have been laid before us<sup>339</sup>; and I shall indeavour in my future answers to any of y<sup>rs</sup> w<sup>ch</sup> we cannot receive to often, to give you some Information of what ever is new in Natural Philosophy, occurs to S<sup>r</sup> y<sup>rs</sup> &c.

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<sup>323</sup> In the copy, this paragraph reads, Your last letter concerning the minute fibrilla of the muscles in a whale compared with those of smaller Animals is curious seeming to shew that the greater strength of the Muscles in those large Animals does not proceed from the minute or least fibrilla being larger than they are in lesser animals but from their being a congeries or number of them bound together by the External membrane encompassing the whole body of the muscle as a large Rope has it's greater strength from the numerousness of the fibres of the Hemp that compose it, tho each particular fibre has the same size & Texture as it has in a small thread.

<sup>324</sup> The copy omits *in respect of Insects*.

<sup>325</sup> The copy omits *whales*.

<sup>326</sup> The copy omits *I presume to*

<sup>327</sup> The copy omits *that I apprehend*.

<sup>328</sup> The copy omits *especially the smaller those living Atomes, such as mites & the like*.

<sup>329</sup> *in themselves are scarce visible at least*, in the copy, muscles are themselves not visible.

<sup>330</sup> The copy omits *these*.

<sup>331</sup> *more fine and delicate texture of the muscles of such slender limbs*, in the copy, proportional finesse or delicacy in their component fibres.

<sup>332</sup> *judged*, in the copy, thought.

<sup>333</sup> *veins, nerves and of the fluids*, in the copy, and veins, and likewise of the fluids of what kind soever.

<sup>334</sup> *may*, in the copy, can.

<sup>335</sup> *this Inquiry, the Royal*, in the copy, and trace this discovery, This Learned.

<sup>336</sup> *your*, in the copy, Leasure and.

<sup>337</sup> *to attempt and make*, in the copy, undertake.

<sup>338</sup> *by the Society's order*, in the copy, from the Royal Society. WALLER probably refers to the same volume 27 of *Philosophical Transactions* that SLOANE discusses in Letter L-500 of 24 October 1713, in this volume.

<sup>339</sup> *us*, in the copy, them.

## ADDITIONAL LETTERS ...

<i>Letter:</i>	<b>L-503 of 8 March 1714</b>
<i>Written by:</i>	RICHARD WALLER (for the Royal Society).
<i>Manuscript:</i>	This letter is known only by reference in L.'s reply.
<i>Summary:</i>	In this letter, the Royal Society graciously expresses its pleasure in having received L.'s recent letter about muscle fibers. The Society sends some numbers of <i>Philosophical Transactions</i> .
<i>Source:</i>	Letter 306 [X] L-504 of 22 June 1714 to the Royal Society.
<i>Remarks:</i>	<p>Beginning in 1696, <i>Philosophical Transactions</i> editor HANS SLOANE wrote 21 letters to L., stopping only when EDMOND HALLEY replaced him as the Royal Society's second secretary and <i>Philosophical Transactions</i> editor on 30 November 1713. In 1714, the Royal Society's first secretary and former <i>Philosophical Transactions</i> editor RICHARD WALLER stepped in and wrote four letters to L. Since no one else from the Royal Society wrote to L. in 1714, WALLER most likely wrote the present letter, too. After he died, in either late December 1714 or early January 1715, there was no further correspondence between L. and the Royal Society until the middle of 1717.</p> <p>WALLER's previous letter to L. is Letter L-502 of 3 March 1714. See the Remarks to that letter for an overview of his correspondence with L. WALLER's next letter is Letter L-505 of 19 July 1714. Both letters are in this volume and L. did not reply directly to either of them.</p>

<i>Letter:</i>	<b>L-505 of 19 July 1714</b>
<i>Written by:</i>	RICHARD WALLER.
<i>Manuscript:</i>	The manuscript is to be found in London, Royal Society, Early Letters W3.87, 2 p. In the copy to be found in London, Royal Society, Letter Book Original 15.47, pp. 98-100, some of the spelling and punctuation is modernized.
<i>Published in:</i>	Not published.
<i>Summary:</i>	In this letter, WALLER writes about how the Royal Society received L.'s recent observations. He asks L. to examine the muscles of insects. He ends by saying that the Royal Society had several members to translate his letters and promising to send the most recent volume of <i>Philosophical Transactions</i> .
<i>Remarks:</i>	<p>At the end of the manuscript is the note, dating WALLER's answer erroneously, "The translation of Mr LEEUWENHOEK's letter to the Royal Society dat. June 22 1714 S.N. Read June the 24th 1714 S.V. And Mr WALLERS answer July the 1st 1714. Enter these letters in the Letter Book." S.N. is <i>Stilus Novus</i> New Style, and S.V. is <i>Stilus Vetus</i>, Old Style.</p> <p>L. refers to WALLER's letter in Letter 307 [XI] L-507 of 21 August</p>

1714, *Collected Letters*, vol. 17:

I have seen in the most gracious and pleasant letter of the 8th of July 1714 of You, Very Noble Sirs, that my missive has given great pleasure, and that I should not fail to continue to send my further discoveries; also that You, Very Noble Sirs, desire to see the drawings I mentioned in my last letter of the parts which I had standing before the magnifying glass; some of them are enclosed herewith.

WALLER's previous letter to L. is Letter L-502 of 3 March 1714. His next letter to L. is Letter L-506 of 27 July 1714. Both letters are in this volume and L. did not respond directly to either of them.

*Text:*

Lond: July the 8 1714

Worthy Sir

Yours of the 22<sup>d</sup> past we received<sup>340</sup>, which being read in the next meeting of the Royal Society, I was ordered to return you the Thanks of the Society for that and your former communications and to desire the continuance of the like favours from you<sup>341</sup>. and to assure you that (whereas you seeme to doubt whether the Society were fully satisfyed as to some of your observations on the minute fibrilla of the flesh-fibres of a muscle) the Society never had the least scruple as to the truth of those or any other of your Microscopical Discoverys, many of which have indeed to some Persons at first seemed wonderfull. But Time and future Observations have allways verifed them and reconciled the scrupulous Inquirer to your Assertions: In my last indeed I proposed the small muscles of Insects to your Inquiry, the generality of those creatures having as I may say their Bones on the outsides of their Limbs, so I thought it possible that there might be some other peculiar Mechanisme for the moving of them, which I venture to recommend to y<sup>r</sup> farther Enquiry, and if you please to send the Delineations of the fibrilla of the muscles of the flies with those of larger animalls w<sup>ch</sup> you mention you have before your Microscope you may be assured of a gratefull acceptance<sup>342</sup>.

As to what you mention in y<sup>r</sup> last of the Delineations of the small fibres of a muscle not being publisht in the Transactions, you will find the letter those figures belong to has not yet been printed: In the next Transactions that are published w<sup>ch</sup> I purpose shortly to undertake I shall take care to have them well graved and inserted<sup>343</sup>. Any other curious

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<sup>340</sup> Letter 306 [X] L-504 of 22 June 1714, *Collected Letters*, vol. 17.

<sup>341</sup> Meeting of 24 June 1714, Royal Society, Journal Book Original, vol. 12, p. 6. "A letter from Mr. LEUWENHOEK dated Delft June the 22 1714 was read giving his thanks for the Transactions to the end of the year 1712 sent him which he has received, confirming his observations on the fibrillae of the muscles of the whales, oxen, and lesser animals, all which in their least fibres are of the same size and offering to send the delineations of the fibrillae as seen with a microscope if the society desires it. Mr. WALLER was ordered to draw up an answer to this letter and to send the last years Transactions."

<sup>342</sup> In the following months, L. responded by writing about muscle fibers of many animals but especially flies in Letter 307 [XI] L-507 of 21 August 1714 and Letter 308 [XII] L-509 of 26 October 1714, *Collected Letters*, vol. 17.

<sup>343</sup> Neither of those letters about muscle fibers was published in *Philosophical Transactions*. L. published them himself in the *Send-Brieven* in 1718.

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discovery you shall please to communicate to the Society shall be faithfully translated and read in our Publick meetings and the Society's answer transmitted to you as soon as possible, by me who shall allways esteeme it as a particular happyness to have any Opportunitys of showing how much I am &c

S<sup>r</sup>  
Y<sup>r</sup> most humble serv<sup>t</sup>

R.W.

P.S.

S<sup>r</sup> for the future you need not give yourself the trouble of having your Letters translated into Latine But may express your selfe as formerly in your own Language There being several gentlemen of the Society who will think no trouble to translate Mr LEEUWENHOEKs Letters<sup>344</sup>.

The Society have ordered a present of the last Vol. of the Phil: Transactions which shall be sent the first Opportunity<sup>345</sup>.

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<i>Letter:</i>	<b>L-506 of 27 July 1714</b>
<i>Written by:</i>	RICHARD WALLER.
<i>Manuscript:</i>	The manuscript is to be found in London, Royal Society, Early Letters B2.101, 1 page. In the copy to be found in the Letter Book Original vol. 15, p. 109, the spelling and punctuation are modernized. Neither manuscript nor copy is signed.
<i>Published in:</i>	Not published.
<i>Summary:</i>	In this letter, WALLER acknowledges the receipt of L.'s latest letter and thanks L. for his ongoing communication with the Royal Society. He states that he will publish whatever L. sends to him and will get the numbers of <i>Philosophical Transactions</i> to him as soon as possible.
<i>Remarks:</i>	On the back side of the manuscript page, WALLER wrote "To Mr LEEUWENHOEK July 16, 1714 To be entered in the Letter Book." The copy found in the Letter Book Original vol. 15, p. 109 begins, "A Letter to Mr. LEEUWENHOEK from Mr. Waller S.S.R. dated July the 16 <sup>th</sup> 1714."

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<sup>344</sup> Over the following years, JOHN CHAMBERLAYNE, JAMES JURIN, CONRAD SPRENGELL, and PHILLIP HENRY ZOLLMAN all translated letters from L.

<sup>345</sup> *Philosophical Transactions* volume 28, with HANS SLOANE as editor, was published in a single long issue, number 337, in late 1713. It contained one letter from L., Letter 302 [VII] L-496 of 28 June 1713, published as "A letter from Mr. Anthouy [sic] van Leeuwenhoek, F. R. S. containing some further microscopical observations on the animalcula found upon duckweed, &c."



L. refers to WALLER's letter in the postscript to Letter 307 [XI] L-507 of 21 August 1714 to the Royal Society:

Today, when I was about to seal this down, I received the very pleasant letter of July the 16th from You, Very Noble Sirs, as well as a parcel of *Transactions*, which is brought to my house by a servant of the very honourable gentleman, Mr VAN BOETSELAAR.<sup>346</sup>

*Text:*

Worthy S<sup>r</sup>

Altho I sent the last week by the Post a letter<sup>347</sup> in answer to y<sup>rs</sup> of the 22<sup>d</sup> of June last<sup>348</sup> yet I cannot omit this opportunity of presenting you with my particular service and acquainting you with the honourable sense the Society have of y<sup>r</sup> Communications with our desire of y<sup>e</sup> continuation of them; as I intimated in my last, I shall very speedily set upon the publication of the Transactions of which for some reasons I shall publish one every 3 or 4 months, which will about about as larg as the single ones used to be formerly, when as soon as published I have at y<sup>r</sup> service, which shall constantly be sent by the first Convenience. and what Discoverys you shall think fit transmit to us I shall take care to have inserted in them<sup>349</sup>. So wishing you health I am &c.

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<i>Letter:</i>	<b>L-508 of 30 August 1714</b>
<i>Written by:</i>	RICHARD WALLER.
<i>Manuscript:</i>	The manuscript is to be found in London, Royal Society, Early Letters W3.92; 1 p. In the copy to be found in London, Royal Society, Letter Book Original, vol. 15, p. 109, some of the spelling and punctuation is modernized.
<i>Published in:</i>	Not published.
<i>Summary:</i>	In this letter, WALLER acknowledges the receipt of L.'s latest letter and thanks L. for his observations on the texture of muscles. He regrets that official thanks will have to wait until October because of the Royal Society's annual recess.

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<sup>346</sup> Mr. VAN BOETSELAAR may be the young PHILIPS JACOB BARON VAN DEN BOETZELAER (1690-1772), who enrolled as a law student at Utrecht University in 1713. He was related to the Delft Van Reede family. His grandfather of the same name had married in Delft in 1678.

<sup>347</sup> Letter L-505 of 19 July 1714, in this volume.

<sup>348</sup> Letter 306 [X] L-504 of 22 June 1714, in this volume.

<sup>349</sup> EDMOND HALLEY was the editor of *Philosophical Transactions* for volumes 29 and 30, so WALLER must have been assisting him, to no avail, however, because HALLEY published none of the 10 letters that L. addressed to the Royal Society between June 1714 and November 1717. In Letter L-575 of 26 May 1722, *Collected Letters*, vol. 19, the new Royal Society secretary and *Philosophical Transactions* editor JAMES JURIN reported his discovery that several letters had not even been translated from the Dutch.

## ADDITIONAL LETTERS ...

*Remarks:* This is the last letter to L. from WALLER, who died the following winter. The previous letter to L. from WALLER is Letter L-506 of 27 July 1714, in this volume. L. did not reply directly to either letter.

*Text:*

Worthy S<sup>r</sup>

Yo<sup>r</sup> last<sup>350</sup> with y<sup>r</sup> farther observations on the texture of y<sup>e</sup> muscles I recd two days since but it being the time of the annual Recess of the Royal Society till y<sup>e</sup> 21<sup>st</sup> of Oct<sup>r</sup> next I cannot return the thanks of the Society for y<sup>r</sup> Communications. I shall take care to have them read at their first weekly meeting<sup>351</sup>. But in the mean time thought the proper to advise you of the Receipt thereof who

am S<sup>r</sup> &c<sup>352</sup>

Lond Aug<sup>st</sup> the 19 1714

- Letter:* **L-511 of 9 November 1714**
- Addressed to:* ISAAC NEWTON.
- Written by:* ANTONI VAN LEEUWENHOEK.
- Manuscript:* This letter is known only by reference in other sources.
- Summary:* L. writes a letter to ISAAC NEWTON, contents unknown, as a cover letter to another letter.
- Sources:* HALL, R. & TILLING, L., eds., *Correspondence of Isaac Newton*, vol. VI 1713–1718, p. 186: “Item 1114: Antoni van Leeuwenhoek to Newton, 29 October 1714”.  
TAYLOR, J.C., *Catalogue of the Newton Papers Sold by Order of the Viscount Lymington*, p. 21: “Lot 129: Collection of Letters to Newton, mostly of compliment, from foreign Scholars (in Latin) including: ... A. van Leeuwenhoeck (in Dutch, 4 pp. 4to. Delft 9 Nov. 1714)”.
- Remarks:* The date is New Style, which was eleven days ahead of the Old Style date of 29 October 1714 used by the editors of NEWTON’s correspondence in London. The letter that the present letter covered is Letter 310 [XIV] L-512 of 9 November 1714, *Collected Letters*, vol. 17, where it says that the manuscript “is to be found at Uppsala Universitet, Universitets-

<sup>350</sup> Letter 307 [XI] L-507 of 21 August 1714, *Collected Letters*, vol. 17. L.’s N.S. date was 10 August in London. If WALLER received it on 17 August, the letter went from Delft to London in less than a week.

<sup>351</sup> The letter was read at the 23 December 1714 meeting of the Royal Society. Journal Book Original vol. 12, pp. 20 and 35.

<sup>352</sup> This is WALLER’s last known letter to L.

bibliotheket, Waller Ms beul-00476; 4 quarto pages.” The reference should be “benl”. The Remarks should note that a Latin translation, probably made in Delft before L. sent it, is to be found in London, Royal Society, Letter Book Original 15.65, p. 154. The Remarks erroneously state that Letter 310 [XIV] L-512 was not read at a meeting of the Royal Society. The Letter Book Original notes that it was read three months later on 10 February 1715 O.S.

The question is whether the letter, addressed to the Royal Society, was accompanied by a cover letter addressed to Royal Society president ISAAC NEWTON.

HALL and TILLING, *The Correspondence of Isaac Newton*, vol. 6, p. 186, notes the existence of two letters:

This letter was sold in a lot of 38 items, ‘mostly [letters] of compliment from foreign scholars (in Latin),’ by Messrs Sotheby in 1936 (Lot 129). All of these items have vanished for the present.

This appears to be the only evidence of correspondence between NEWTON and the Dutch microscopist; the letter, written in Dutch, may have some connection with another letter of the same date, but written in Latin and addressed to the members of the Royal Society (see Letter Book of the Royal Society of London, xv (copy), p. 182). This was one of the many letters on microscopical observations sent by LEEUWENHOEK to the Royal Society.

This Latin “letter of the same date” is the translation in the Royal Society’s Letter Book Original. HALL and TILLING’s reference to vol. xv, p. 182, of the Letter Book is also in error. It should be p. 154.

If the description of item 129 in the *Catalog of the Newton Papers* refers to the present letter, then at four quarto pages, it is more than a simple cover letter. However, it is probable that item 129 is Letter 310 [XIV] L-512 of 9 November 1714, which is also four quarto pages and is in *idem*, vol. 17.

After being able to examine the “vanished” letters in Uppsala, RUPERT HALL wrote an article in 1982 titled “Further Newton Correspondence”, *Notes and Records of the Royal Society of London*, vol. 37, no. 1, in which he reproduced, and in some cases translated from the Latin, 33 letters of compliment to NEWTON (and six from NEWTON to others). He notes that three letters in Uppsala from French and Italian correspondents are not included in the article, which leaves two of the 38 letters in Lot 129 unaccounted for, possibly the two letters from L.

Several times prior to 1714, L. sent a cover letter addressed to either the Royal Society president or *Philosophical Transactions* editor (or, once, to ANTHONIE HEINSIUS) that accompanied a letter with scientific observations. Sometimes, the letter that the cover letter accompanied begins with observations and not any of the honorifics or other introductory material that begin most of his letters.

The letter in Uppsala, Letter 310 [XIV] L-512, has no introductory material, arguing for the existence of a cover letter. Since around 1700, L. had been addressing those cover letters to HANS SLOANE, as editor. However, by 1714 EDMOND HALLEY was editor and was not publishing

## ADDITIONAL LETTERS ...

L. at all, so perhaps L. thought it better to address the cover letter to NEWTON, as president, as he had in the past sent letters to Royal Society presidents WILLIAM BROUNCKER in 1677, JOSEPH WILLIAMSON in 1678, CHRISTOPHER WREN in 1683, and JOHN SOMERS in 1701.

ISAAC NEWTON (1643-1727) was elected president of the Royal Society on 30 November 1703 and served until 1727.

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<i>Letter:</i>	<b>L-517 of 2 July 1715</b>
<i>Written by:</i>	ANTONI CINK.
<i>Manuscript:</i>	This letter is known only by reference in L.'s reply.
<i>Summary:</i>	In this letter, ANTONI CINK tells L. about his recent activities. He has shown L.'s letter about tendons and muscle fibres to two colleagues, who replied with a letter to CINK expressing their pleasure; CINK encloses that letter.
<i>Source:</i>	Letter 315 [XVII] L-518 of 7 July 1715 to ANTONI CINK.
<i>Remarks:</i>	<p>In the following year, three professors at the university in Louvain would present L. with a medal in honour of his achievements: ANTONI CINK (1668-1742), professor of philosophy, URSMER NAREZ (1678-1744), professor of medicine, and HENDRIK JOZEF REGA (1690-1754), professor of chemistry. See Letter L-536 [XXV] of 12 June 1716 and Letter L-535 of 3 June 1716, both in <i>Collected Letters</i>, vol. 18.</p> <p>CINK's previous letter to L. is Letter L-498 of October 1713, in this volume, which he sent through GERARD VAN LOON. See that letter for an overview of the correspondence between CINK and L. L. replied with Letter 305 [IX] L-501 of 24 October 1713 refuting the ideas of KIRCHER and Letter 314 [XVI] L-516 of 26 March 1715 about tendons and muscle fibres. Both letters are in <i>idem</i>, vol. 17.</p> <p>L. replied promptly to the present letter with Letter 315 [XVII] L-518 of 7 July 1715, also about tendons and muscle fibres. CINK's next and last letter to L., Letter L-534 of 24 May 1716, in this volume, is also signed by NAREZ and REGA.</p>

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<i>Letter:</i>	<b>L-525 of some years before 1716</b>
<i>Addressed to:</i>	FREDERIK ADRIAAN VAN REEDE.
<i>Written by:</i>	ANTONI VAN LEEUWENHOEK.
<i>Manuscript:</i>	This letter is known only by reference in another letter.
<i>Summary:</i>	In this letter, L. writes in detail to VAN REEDE about the large number of eggs, approximately 9,344,000, in the roe of a ling.

*Source:* Letter 322 [XX] L-527 of 3 March 1716 to GOTTFRIED W. LEIBNIZ.  
*Remarks:* This letter is difficult to date because in no previous letter does L.'s computation of eggs involve the number 9,344,000. In only two letters does L. discuss ling, Letter 270 L-457 of 25 July 1707 and Letter 288 L-481 of 22 September 1711, both addressed to the Royal Society and both to be found in *Collected Letters*, vol. 16. The only previous letters from L. to VAN REEDE about sea creatures are letters in 1695 and 1696 about oysters and Letter 211 [125] L-368 of 2 June 1700, *idem*, vol. 13, about shrimp.

L.'s previous letter to VAN REEDE is Letter 229 [141] L-393 of 26 August 1701, *idem*, vol. 14, about measuring the fall of water. His next and final letter is Letter L-558 [XLII] of 10 September 1717, *idem*, vol. 18, about, among other things, how the fish's scales determine the age of herring, perch, bream, and cod. There is no known reply from VAN REEDE to either letter.

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*Letter:* **L-529 of May 1716**

*Written by:* CORNELIS SPIERING.

*Manuscript:* This letter is known only by reference in L.'s reply.

*Summary:* In this letter, CORNELIS SPIERING tells L. about an accident in which a large carp from his pond died. He gives the length and girth measurements of the carp and encloses some scales with his letter.

*Source:* Letter 327 [XXIV] L-533 of 22 May 1716 to CORNELIS SPIERING.

*Remarks:* L. usually responded promptly to letters, so it is likely that CORNELIS SPIERING van Spieringshoek (1663-1745) wrote this letter in May 1716 or shortly before. This is the only known exchange of letters between L. and SPIERING, who lived in L.'s neighbourhood. He had worked with L. in Delft's city hall in his role as member of the *Veertigraad* (city council) after 1691 and as magistrate from 1696-1703 and again from 1708-1710. After this exchange of letters, SPIERING served as a mayor of Delft for three years, 1717, 1718, and 1724.

It is not clear whether the pond was in the back of SPIERING's house on the Westsingelgracht or in one of the many gardens outside the walls of the city.



## Appendices

## APPENDICES

### Appendix 1. Constantijn Huygens Correspondence (1674-1685)

Seven letters from HUYGENS to L. from 1674 to 1685.

Seven letters to HUYGENS from L. from 1674 to 1679.

None of these letters was published by L. himself, so none has an AvL number.

L-#			CL <sup>1</sup> #	CL vol	
L-004	February 1674	from		20	encloses an extract of a letter from HENRY OLDENBURG that asks HUYGENS to encourage L.'s nature study
L-005	5 April 1674	to	4	1	globules in milk, blood; theory about structure and growth of hair, tumours
L-007	11 April 1674	from		20	responds to letter of 5 April 1674; will forward that letter to his son CHRISTIAAN and would like to receive more letters
L-009	24 April 1674	to	7	1	composition and colour of blood; texture of bones and teeth; salt crystals
L-019	26 December 1674	to	14	1	cover letter for extracts from two letters to HENRY OLDENBURG, Letter 11 [6] L-015 of 7 September 1674 and Letter 13 [8] L-018 of 4 December 1674, about the optic nerve of a cow and a copy of the drawing of an optic nerve that he sent with the second letter
L-044	31 October 1676	from		20	returns copy of Letter 26 [18] L-040 of 9 October 1676 to HENRY OLDENBURG about little animals in infusoria; wonders why L. structured it like a journal; his son will translate the letter into French and send it to Paris
L-045	7 November 1676	to	28	2	extract from Letter 26 [18] L-040 of 9 October 1676 to HENRY OLDENBURG; living organisms in water and vegetable infusions; reproduction of vinegar eels

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<sup>1</sup> CL = *Collected Letters of Antoni van Leeuwenboek*



L-#			CL #	CL vol	
L-062	8 December 1677 <sup>2</sup>	from		12	returns copy of Letter 35 [22] L-060 of November 1677 to WILLIAM BROUNCKER about sperm, which he considers of extreme interest; thanks for information about gnat wings membranes
L-076	23 December 1678	from		20	son CHRISTIAAN has found little animals in pepper infusion; his description of scales on butterfly wings
L-077	26 December 1678	to	41	2	replies to letters of CONSTANTIJN and CHRISTIAAN HUYGENS about little animals in pepper infusions and scales on butterfly wings
L-081	27 April 1679	to	44	3	quantifies the number of sperm in the milt of a cod and a cock; promises to write to CHRISTIAAN HUYGENS about the movements of microorganisms
L-082	4 May 1679	from		20	son CHRISTIAAN's new book <i>Dioptrica</i> about to be published
L-085	20 May 1679	to	47	3	speculations on microscopic and submicroscopic dimensions; component parts of water are unimaginably small
L-167	17 December 1685 <sup>3</sup>	from		7	praises L.'s profound discoveries; queries about root trees

<sup>2</sup> Within Letter 196 [113] L-349 of 17 December 1698 to HARMEN VAN ZOELLEN, *Collected Letters*, vol. 12, p. 259.

<sup>3</sup> Within Letter 109 [64] L-199 of 24 August 1688 to the Royal Society, *idem*, vol. 7, p. 361.

## APPENDICES

### Appendix 2. Henry Oldenburg Correspondence (1673-1677)

Eighteen letters from OLDENBURG to L. from 1674 to 1677.

Twenty-seven letters to OLDENBURG from L. in 1673 and 1677. Twelve of them were published in *Philosophical Transactions*.

See the Remarks to Letter L-010 of 4 May 1674, in this volume, for an overview of their correspondence.

L-#			AvL <sup>1</sup> #	CL #	CL vol	
L-001	28 April 1673	to	1	1	1	structure and growth of mould; bee's mouth, sting, and eye; louse mouth, feelers, and legs
L-002	15 August 1673	to	2	2	1	figures of a bee's sting; motion of fluids in deal and oakwood; ash-tree root; digestion in lice; compression of air
L-003	8 Nov. 1673	to		3	1	known only by reference in letter of 7 April 1674
L-006	7 April 1674	to	3	5	1	human blood and cows' milk; human hair and elk's hair; muscles and fat of various creatures
L-008	16 April 1674	to		6	1	how to send letters; asks OLDENBURG to befriend JUSTUS VAN CONINCXBRUGH
L-010	4 May 1674	from			20	L.'s observations are acceptable to the Society; ROBERT BOYLE wants L. to investigate why blood turns red when exposed to air; encloses two numbers of <i>Philosophical Transactions</i>
L-011	1 June 1674	to	4	8	1	Blood capillarity; growth of skin and plants; technique for examining blood, brain, spine, muscles; motion of liquid in tubes; globules in fluids; bone, tooth, liver, brain; small packets of specimens: cork, pith of elder, white of a quill
L-012	6 July 1674	to	5	9	1	human and horse sweat and hair; movement of blood in narrow glass-pipes; fat in cows, sheep, fish

<sup>1</sup> AvL – the 192 letters numbered by L., 165 of which he published himself.

## APPENDICES

L-#			AvL <sup>1</sup> #	CL #	CL vol	
L-013	30 August 1674	from			20	responds to letters of 1 June 1674 and 6 July 1674; praises his observations; passes on the compliments of BOYLE
L-014	7 September 1674	to		10	1	will send further observations; see letter of 7 September 1674
L-015	7 September 1674	to	6	11	1	cow's eye and optic nerve; minerals: salt, clay, English and Flemish earth; first mention of protozoa in lake water
L-016	19 October 1674	to	7	12	1	eggs in the bile of cows, sheep, rabbits and poultry; structure of metals, skin, and bladder; the sense of taste
L-017	5 November 1674	from			20	receipt of L.'s recent letters; greetings from BOYLE; encourages L.'s observations; asks for clarification about "musk" and the kind of salt he is observing
L-018	4 December 1674	to	8	13	1	iris of the eye; the optic nerve; how to examine brains; comments about criticisms of his observations of the brain; encloses specimen of optic nerve
L-020	3 January 1675	from			20	praises L.; greetings from THOMAS WILLIS; doubts about globules in so many things; asks L. to re-examine the optic nerve because observations of WILLIS and others do not agree with L.'s; asks L. to observe tobacco and tobacco seeds
L-021	22 January 1675	to	9	15	1	new methods for observing blood, brain tissue; optic nerve lengthwise; tobacco and its smoke; saltpetre, gunpowder; sting of scorpions, their poison
L-022	11 February 1675	to	10	16	1	crystallisation of salts and infusions; vinegar, soap, aqua fortis, pepper, mustard; globules in fish bile; optic nerve of cod and cows; cod roe; objections to FRANCESCO REDI's figure of a louse; veins of an oak leaf

## APPENDICES

L-#			AvL <sup>1</sup> #	CL #	CL vol	
L-023	1 March 1675	from			20	two most recent letters well received at the Society; learned people in Paris disagree with L.'s discovery of globules everywhere; asks for better drawings of salt; suggests that the problem may lie in L.'s microscope
L-024	26 March 1675	to	11	17	1	marrow fats, peas, runners; venous blood; transparency of objects; circulation in oak leaves and human veins; how blood nourishes veins in the connective tissue between muscles; a louse's leg
L-025	22 April 1675	from			20	receipt of letter of 26 March 1675; praises L. and recommends that he ask other people to help him understand what he sees through his lenses
L-026	14 August 1675	to	12	18	1	blood during an illness; arum leaves; plant sap and its taste; taste of sugar, salt and manna due to their minute particles; manna's laxative effects; human digestion and the effects of poison on the stomach
L-027	22 August 1675	from			20	acknowledges letter of 14 August 1675
L-028	20 December 1675	to	13	19	1	error in earlier experiments with vegetable infusions; little animals in water; wine-vinegar; invention of an areometer; notes ROBERT BOYLE's similar instrument
L-030	7 January 1676	from			20	in French, which he assumes L. knows; the members of the Society had no opinion about L.'s latest observations; would send more numbers of <i>Philosophical Transactions</i> , but fears the postage will be too expensive
L-031	22 January 1676	to		20	1	requests past numbers of <i>Philosophical Transactions</i> ; promises to send his account of living creatures found in rain water

## APPENDICES

L-#			AvL <sup>1</sup> #	CL #	CL vol	
L-032	13 February 1676	from			20	ROBERT HOOKE's ideas about hair differ from L.'s; <i>Philosophical Transactions</i> nos. 113 and 117 and any future numbers to be sent by ordinary market boat to Rotterdam, as L. requested
L-033	20 February 1676	from			20	letter forwarded by CONSTANTIJN HUYGENS with some numbers of <i>Philosophical Transactions</i> , postage pre-paid by OLDENBURG
L-034	22 February 1676	to	14	21	1	hair and its growth; refutes JOHAN VAN BEVERWIJK's ideas on the structure and growth of hair; cow skin; egg membranes
L-035	21 April 1676	to	15	22	2	wood vessels, with reference to a book by NEHEMIAH GREW; eel-like creatures in French wine; taste of cinnamon
L-036	14 May 1676	from			20	L.'s observations about hair agree with HOOKE's; has given GREW L.'s remarks about vessels in wood; notes GREW's opinions on the shape of these vessels
L-037	29 May 1676	to	16	23	2	clarifying observations about the structure of wood, which GREW had questioned; vessels, fibres, medullary rays of wood
L-038	28 July 1676	to		24	2	Known only by reference in letter of 9 October 1676 to OLDENBURG and letter of 18 October 1676 from OLDENBURG
L-040	9 October 1676	to	18	26	2	five different microorganisms - one possibly bacteria - in pepper-infused water; spice infusions of rain-, well-, moat-, sea-, and river-water; structure of peppercorn, wheat, ginger; whether or not organisms exist in the air

## APPENDICES

L-#			AvL <sup>1</sup> #	CL #	CL vol	
L-041	18 October 1676	from			20	observations about the anatomy of trees in letter of 21 April 1676 well received by GREW; observations about effect of air on ammonia and copper in letter of 28 July 1676 to ROBERT BOYLE well received by him; encloses <i>Philosophical Transactions</i> , no. 127, containing letter of 21 April 1676
L-042	26 October 1676	from			20	received letter of 9 October 1676 about microbes in infusions
L-043	30 October 1676	to		27	2	pleased with GREW's remarks, although he could not understand them; will reply when letter is translated
L-046	12 November 1676	from			20	received letter of 26 October 1676 and will respond more fully as soon as possible
L-047	27 November 1676	to		29	2	known only by reference in letter of 5 October 1677 to OLDENBURG and probably also in Letter 30 L-051 of 15 February 1677 to CHRISTIAAN HUYGENS
L-052	22 February 1677	from			20	observations of spice infusions in letter of 9 October 1676 well received by the Society, although they find it hard to conceive of the quantity of little animals that L. claims to have seen; passes along greetings of BOYLE and GREW
L-053	4 March 1677	from			20	asks L. to further study muscles and brains
L-054	23 March 1677	to	19	31	2	calculates the number of little animals in a drop of water; announces further observations of them
L-055	20 April 1677	from			20	courtesy letter from himself and the members of the Society
L-056	14 May 1677	to	20	32	2	muscle tissue, brain and spinal cord; investigates haemolysis; bundles of vessels in fruits and seeds; effects of moxa on gout; use of cotton for bandages

## APPENDICES

L-#			AvL <sup>1</sup> #	CL #	CL vol	
L-057	7 August 1677	from			20	delivered by HENNIG BRAND as a cover letter for <i>Philosophical Transactions</i> no. 136; asks L. to examine the skin of Moors
L-058	5 October 1677	to	21	33	2	theory about different skin colours; reproduction of lice, eels, and their blood; larvae of fleas compared to silkworms; JOHANNES SWAMMERDAM's views on fleas; a millet grain as a measure of cubic capacity; testimonials from BENEDICT HAAN, HENRICUS CORDES, R GORDON, J BOOGERT, ROBERT PORTEVIN, WV BURCH, ALBERT HODENPIJL, and ALEX PETRIE about the quantity of little animals in a drop of water

## APPENDICES

### Appendix 3. Robert Hooke Correspondence (1677-1698)

Thirteen letters from HOOKE to L. from 1677 to 1698.

Fifteen letters to HOOKE from L. from 1678 to 1682. Two of them were published in *Philosophical Transactions*, L-097 of 12 January 1680 and L-102 of 5 April 1680.

See the Remarks to Letter L-063 of 10 December 1677, in this volume, for an overview of their correspondence.

L-#			AvL #	CL #	CL vol	
L-063	10 December 1677	from			20	acknowledges L.'s letter of November 1677 to WILLIAM BOUNCKER describing sperm in human semen
L-065	11 January 1678	from			20	co-signed by NEHEMIAH GREW; due to ill health, WILLIAM BOUNCKER replaced as Royal Society president by JOSEPH WILLIAMSON
L-067	14 January 1678	to	23	37	2	human blood; recounts DE GRAAF's blood transfusion from one dog to another; milk; L's sputum; larvae of fleas; organisms in pepper water
L-068	11 February 1678	from			20	verified L.'s observations of little animals in spice infusions
L-072	28 April 1678	from			20	King CHARLES II saw little animals in pepper water; muscles in shellfish
L-091	August 1679	from			20	lost in transit; known only by reference in letter of 20 November 1679
L-092	13 October 1679	to		51	3	asks for acknowledgement of previous letters; encloses extract of Letter 50 L-090 of 11 July 1679 letter to LAMBERT VAN VELTHUYSEN; bladder-stones
L-094	27 October 1679	from			20	acknowledges previous letter; asks L. to examine fecund and sterile eggs for spots; promises to send current numbers of <i>Philosophical Transactions</i>
L-096	20 November 1679	to		53	3	sends copy of Letter 52 L-095 of 14 November 1679 letter to VAN VELTHUYSEN
L-097	12 January 1680	to	29	54	3	germinal spot of an egg; various trees; movement of water in trees; sperm of various fish; diagram of circumference of oak, alder, etc. showing annual growth rings



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L-#			AvL #	CL #	CL vol	
L-098	16 January 1680	to		55	3	received <i>Philosophical Collections</i> ; encloses copy of Letter 47 L-085 of 20 May 1679 to CON. HUYGENS; living organisms in pepper and ginger infusions
L-099	2 February 1680	from			20	asks whether L. is interested in becoming a member of the Society
L-100	13 February 1680	to		56	3	being elected member of the Society would be an honour
L-102	5 April 1680	to	30	57	3	rat testicles and sperm; organisms in oyster gills and sap of vines
L-103	22 April 1680	from			20	L. unanimously elected a member of the Society; THOMAS GALE now in charge of foreign correspondence
L-105	13 May 1680	to		59	3	gratefully accepts election to the Society; acknowledges receipt of diploma
L-107	14 June 1680	to		61	3	cover letter to Letter 62 [32] L-108 of 14 June 1680 to Thomas Gale
L-109	9 August 1680	to		63	3	asks whether the Society received previous letters; promises to investigate formation of blood
L-111	12 November 1680	to	33	65	3	fermenting wine; comparing yeast cells and red blood cells; particles in rain-water; chyle from cow; fat globules in milk; composition of urine; particles in air; function of the heart and circulation of blood; tracheae of fly, flea, cockroach; copulation of cockchafer and dragonflies; sperm of grasshopper, gnat, flea, fly; mites; calculation of number of micro-organisms in a grain of sand
L-112	4 July 1681	from			20	members of the Society thank L. for two previous letters and will have them published; HOOKE concerned that L. has not had proper answers to his letters and promises to do better in the future
L-114	4 November 1681	to	34	66	3	hog's bristle; shedding hair; blackheads; L.'s own faeces when he had diarrhoea; microorganisms in human faeces and other animals; structure of clay; possibility that a blood transfusion can cure gout
L-115	December 1681	from			20	members of the Society thank L. for two previous letters and will publish them

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L-#			AvL #	CL #	CL vol	
L-116	3 March 1682	to	35	67	3	muscle fibres of mammals and fishes; falling out of hairs; hair growth on L.'s own hand; discovery of the cell nucleus in fish blood cells; liver of salmon; ciliar motion of oyster beards; structure and growth of oyster shells
L-117	20 March 1682	from			20	sends <i>Philosophical Collections</i> , nos. 4 and 5; praises and encourages L.'s discoveries about muscles, which agree with his own
L-118	26 March 1682	from			20	L.'s observations of shellfish muscles well received by the Society and concur with his own
L-119	4 April 1682	to	36	68	3	structure of muscle tissue of lobster and shrimp
L-120	28 July 1682	to		69	3	known only by reference in Letter 70 [37] L-122 of 22 January 1683 to WREN
L-345	9 June 1698	from			20	discusses L.'s recent letters; sending copies of L.'s missing numbers of <i>Philosophical Transactions</i> ; encourages L.'s continuing research

#### Appendix 4. Francis Aston Correspondence (1683-1685)

Eleven letters from ASTON to L. from 1683 to 1685.

Five letters to ASTON from L. in 1683 and 1684.

Three of them were published in *Philosophical Transactions*, L-135 of 17 September 1683, L-144 of 28 December 1683, and L-147 of 14 April 1684.

See the Remarks to Letter L-123 of 26 February 1683, in this volume, for an overview of their correspondence.

L-#			AvL #	CL #	CL vol	
L-123	26 February 1683	from			20	accounts for L.'s recent letters and asks him to annotate or translate "terms of art" in his letters; predicts opposition to L.'s position on the role of sperm in reproduction; invites L. to investigate colours.
L-124	9 March 1683	to			20	replies that he will send the Society his observations about generation and colours, among other things
L-125	27 March 1683	from			20	mentions receipt of his letter and new Society officers; promises to send <i>Philosophical Transactions</i>
L-130	27 August 1683	from			20	thanks L. for recent letter and notes it will be published in <i>Philosophical Transactions</i> ; agrees to L.'s request to admit two Dutch noblemen to a meeting of the Society
L-135	17 September 1683	to	39	76	4	aliva; L.'s method for leaning his own teeth; discovery of bacteria in artar; spittle from various people; nasal hairs and blackheads; structure of kin; comparing scabs with fish scales; pores and alluses.

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L-#			AvL #	CL #	CL vol	
L-140	11 October 1683	from			20	asks L. about translation of a Dutch phrase from his Letter 72 [38] L-128 of 16 July 1683 to CHRISTOPHER WREN; discusses the cicatricula on the yolk of a chicken egg
L-143	26 October 1683	to			20	replies to ASTON's 11 October 1683 letter of about the cicatricula on the yolk of a chicken egg
L-144	28 December 1683	to	40	79	4	skin inside L.'s own mouth; his eczema and sweating as cure; child's scaly skin disease (ichthyosis); intestinal wall and peristalsis, blood and lymph vessels; effects of vinegar; absorption of food in the intestines
L-146	7 March 1684	from			20	receipt of L.'s 28 December 1683 letter; promises to send <i>Philosophical Transactions</i> , vol. 13; encourages L. to make experiments
L-147	14 April 1684 <sup>1</sup>	to	41	80	4	eye lens of humans, other animals; function of eye-lids; involuntariness of blinking; cornea of pig, ox; optic nerves; erythrocytes skin of Moors.
L-148	7 June 1684	from			20	thanks L. for letter of 14 April 1684 about lens of the eye, well-received by the Society

<sup>1</sup> After this letter, L. began addressing letters to the members of the Royal Society in general instead of to its secretary, who until December 1685 was FRANCIS ASTON.

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L-#			AvL #	CL #	CL vol	
L-151	August-mid- October 1684	from			20	most recent Letter 81 [42] L-150 of 25 July 1684 to the Society about salts in brains, moxa, and lepers, among many other things, not read yet because the Society is not in session
L-153	20 January 1685	from			20	recent Letter 82 [43] L-152 of 5 January 1685 to the Society about salts in wine and vinegar favorably received
L-156	19 February 1685	from			20	recent Letter 83 [44] of 23 January 1685 to the Society about salts received but not yet read at a meeting
L-158	27 June 1685	from			20	thanks L. for latest observations in Letter 84 [45] L-157 of 30 March 1685 to the Society about sperm and reproduction; passes along the recommendation by JOHN HOSKYNs that L. examine silkworm eggs
L-161	between 9 August and 22 October 1685	from			20	recent Letter 85 [46] L-159 of 13 July 1685 to the Society about reproduction of trees received but not yet read at a meeting

## APPENDICES

### Appendix 5. Anthonie Heinsius Correspondence (1683-1716)

Seven letters from HEINSIUS to L. from 1683 to 1715.

Twenty-eight letters to HEINSIUS from L. from 1683 to 1716. One of them was published in *Philosophical Transactions*, L-489 of 8 November 1712.

See the Remarks to Letter L-127 of 7 June 1683, in this volume, for an overview of their correspondence.

L-#			AvL #	CL #	CL vol	
L-126	20 May 1683	to		71	4	generation, circulation of blood; to be sent to the Society
L-127	7 June 1683	from			20	pleased by letter of 20 May
L-129	22 July 1683	to		73	4	sends copy of Letter 72 [38] L-128 of 16 July 1683 to CHRISTOPHER WREN
L-132	2 September 1683	to		74	4	requests HEINSIUS's opinion on observations in letter of 16 July 1683
L-133	10 September 1683	from			20	from Paris; he and several of his colleagues are pleased by L.'s observations
L-134	16 September 1683	to		75	4	visit of the Duchess of BOUILLON and French ambassador D'AVAUX; asks whether HEINSIUS wants a copy of L.'s speculations on the living little animals in mouths and on the structure of the skin
L-136	30 September 1683	to		77	4	sends a copy of the Letter 76 [39] L-135 to FRANCIS ASTON of 17 September 1683
L-139	8 October 1683	from			20	from Paris; he and several colleagues are pleased by L.'s observations; some of L.'s letters to be published in the new <i>Journal de Médecine</i>
L-141	14 October 1683	to		78	4	replies to letter of 8 October 1683; asks what MELCHISEDEC THEVENOT says about his ideas
L-142	18 October 1683	from			20	from Paris, HEINSIUS responds to a letter from L.
L-160	3 August 1685	from			20	from London; ROBERT BOYLE would like L. to examine cochineal

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L-#			AvL #	CL #	CL vol	
L-162	10 August 1685	to		86	5	examination of cochineal; wrongly considers it a plant seed
L-163	31 August 1685	from			20	from London; ROBERT BOYLE is satisfied with L.'s examination of cochineal, though he correctly thinks it comes from insects
L-164	21 September 1685	to		87	5	re-examination of cochineal; now agrees with BOYLE that cochineal comes from insects
L-247	10 April 1695	to	86	141	10	crabs: blood circulation in leg; crystals in evaporated blood; hairs on leg
L-251	1 May 1695	to	88	143	10	weevils in nutmegs; mite damage to nutmegs; fumigation to prevent damage by larvae; nutmeg root; tobacco seed and its embryo in it; germination and embryos
L-262	20 July 1695	to	91	149	11	scales from L.'s skin; wool threads from his stockings; crystallization of salt from his sweat; air bubbles and salt crystals from his ear wax
L-267	18 August 1695	to	93	154	11	gunpowder detonated in a closed glass bulb to measure the increase of volume; in a partial vacuum, glass bulbs may implode; learned glassblowing at the market
L-304	12 September 1696	to	106	176	12	contradicts idea that acid and fish are unwholesome; rennet and curd from calves' stomachs; rennet in vinegar, wine, and his own blood; chalk and crab's-eye in vinegar; whether bile causes bitter taste of rennet; calf's gall-bladder duct; smoking tobacco as remedy for toothache; calf's omasum; hair balls from rumen; milk clotting in mammals
L-347	20 Sept. 1698	to	112	195	12	blood circulation in eel tail; transition of arterial into venous capillaries; connection between blood vessel wall thickness and blood viscosity

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L-#			AvL #	CL #	CL vol	
L-367	20 May 1700	to	126	210	13	peat composition and origin; alluvial deposition forms peat and dunes; amount of soil washed into the sea by rivers, effect on sea level; comparison to soil lost through peat cutting
L-373	10 July 1700	to	129	215	13	plant seeds and invertebrate parts in peat from Hellevoetsluis
L-458	10 August 1707	to		271	16	cover letter for copy of Letter 270 L-457 of 25 July 1707 to the Society about quinine
L-479	15 August 1711	to		286	16	cover letter to issue of <i>Philosophical Transactions</i> with L.'s article on the pulse; copies of notes on Guinea gold
L-482	23 Nov. 1711	to		289	16	quotations from FRYER and KIRCHER about spontaneous generation, which L. rejects; dissolution of gold, copper, and silver in diluted aqua fortis; separation of gold and copper
L-483	29 Dec. 1711	to		290	16	cover letter for letter to HEINSIUS of the same date; names the man, ALLEN MOULIN, whose article in <i>Philosophical Transactions</i> he criticized without naming him in the enclosed letter, meant for publication.
L-484	29 Dec. 1711	to		291	16	refutes article in <i>Philosophical Transactions</i> , calculates quantity of blood propelled by each heartbeat and each pulse; estimates number of times per hour the total blood volume circulates through the body
L-488	8 Nov. 1712	to		295	17	cover letter for letter of same date later published as first letter in <i>Send-Brieven</i>
L-489	8 Nov. 1712	to	I	296	17	muscle fibres of whales
L-490	17 Dec. 1712	to	II	297	17	salts in shrimp blood; muscle fibres and their membranes in cod, compared to those of a whale; muscle fibres of shrimp, flounder, and perch



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L-#			AvL #	CL #	CL vol	
L-495	29 March 1713	to	VI	301	17	muscle fibres of cow, mouse, sheep, pig, and Danish ox
L-497	30 June 1713	to	VIII	303	17	crabs eyes; lobster and crab shells; ring-shaped structures in lobster pincer shell, compared to annual rings of woody vegetation; membrane of lobster muscle fibres
L-514	11 January 1715	to		312	17	cover letter for a copy of a letter on muscle fibres
L-515	28 February 1715	from		313	17	thanks for letters sent over time; expects that posterity will be grateful for what L. has discovered
L-526	25 February 1716	to		321	17	cover letter to notes about tendons, muscle fibres, and starch grains

## APPENDICES

### Appendix 6. Antonio Magliabechi Correspondence (1686-1708)

Twenty-three letters from MAGLIABECHI to L. from 1686 to 1708, fourteen of them published in *De Boekzaal van Europe* ('Library of Europe') and one in *Twee Maandelijke Uittreksels* (Twice monthly extracts). They mostly contained publication data and summaries of books recently published in Italy.

Twenty letters to MAGLIABECHI from L. from 1686 to 1705. L. numbered and published only one himself, Letter L-363 206 [121] of 16 October 1699.

See also the Remarks to Letter L-172 of 16 March 1686, in this volume.

L-#			AvL #	CL #	CL vol	
L-172	16 March 1686	from			20	courtesy letter that L. finds agreeable
L-174	12 April 1686	to		91	6	acknowledges earlier letter; cover letter for <i>Anatomia et Contemplatio Nonnullorum Naturae invisibilium Secretorum</i> (Anatomy and Contemplation of some invisible secrets of nature) <sup>1</sup>
L-181	10 September 1686	to			20	cover letter for <i>Cinnaber Naturalis</i> (Natural Cinna- bar) <sup>2</sup> , sent through DANIEL PAPENBROEK
L-182	30 October 1686	to		96	6	in Dutch; reviews previous letters and enclosures; common friends DANIEL PAPENBROEK and JACOB GRONOVIVS
L-202	1689	to			20	cover letter for one of his publications, probably <i>Continuatio Epistolarum</i>
L-209	27 May 1691	from			20	L.'s "little book" finally arrived; GOTTFRIED LEIBNIZ satisfied with it; encloses treatise by BERNARDINO RAMAZZINI; first book news, never published

<sup>1</sup> See the Remarks to Letter L-172 of 16 March 1686, in this volume, for a discussion of which book L. sent.

<sup>2</sup> See the Remarks to Letter L-181 of 10 September 1686, in this volume, for a discussion of which book L. sent.

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L-#			AvL #	CL #	CL vol	
L-210	18 September 1691	to		115	8	in Italian; replies to letter of 27 May 1691; distinguished visitors; rust in cereals, suggested by RAMAZZINI treatise; repudiation of spontaneous generation; procreation of eels; sharp taste of pepper; little recent contact with the Society; WILLEM BLAEU as his Italian translator
L-219	24 June 1692	from			20	“Italiaansch Nieuws”, <i>Boekzaal van Europe</i> , March and April 1693
L-238	before 2 March 1694	from			20	“Italiaansch Boek-nieuws”, <i>Boekzaal van Europe</i> , March and April 1695
L-265	1695	to		152	11	dedication to <i>Arcana Naturae Detecta</i>
L-266	16 August 1695	to		153	11	in Latin; informs MAGLIABECHI of <i>Arcana Naturae Detecta</i> dedication; visit of the Elector Palatine
L-272	12 October 1695	from			20	thanks L. for dedication; “Italiaansch Boeknieuws”, <i>Boekzaal van Europe</i> , Nov. and Dec. 1695
L-273	14 October 1695	from			20	another thanks for the dedication
L-274	18 October 1695	to		158	11	in Dutch; cover letter for a parcel of copies of <i>Arcana Naturae Detecta</i> for MAGLIABECHI, given to Baron BETTINO RICASOLI for delivery
L-275	23 October 1695	from			20	“Italiaansch Boeknieuws”, <i>Boekzaal van Europe</i> , March and April 1696
L-276	31 October 1695	to		159	11	in Latin; acknowledges letter of 12 October 1695; the parcel of books sent with Baron RICASOLI; grateful for the news from Italy

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L-#			AvL #	CL #	CL vol	
L-280	5 November 1695	from			20	praises L. for his work
L-282	22 December 1695	to		162	11	in Latin; notes receipt of two letters; reports again that the parcel of books has been sent
L-286	6 March 1696	from			20	finally received the parcel of copies of <i>Arcana Naturae Detecta</i>
L-290	5 June 1696	from			20	“Nieuws”, <i>Boekzaal van Europe</i> , September and October 1696
L-293	8 July 1696	from			20	“Nieuws”, <i>Boekzaal van Europe</i> , September and October 1696
L-301	28 August 1696	to		173	12	in Latin; notes letter from MAGLIABECHI; inquires about reaction of the grand duke to his work; thanks MAGLIABECHI for sending printed matter and book news from Italy
L-303	7 September 1696	to		175	12	in Latin: thanks for letters of 5 June and 8 July 1696; requests that MAGLIABECHI spare him exaggerated praise henceforth
L-310	18 December 1696	from			20	“Italiaansch Boeknieuws”, <i>Boekzaal van Europe</i> , January and February 1697
L-319	February – May 1697	from			20	“XIV Hoofddeel” (chapter), <i>Boekzaal van Europe</i> , May and June 1698
L-322	1 June 1697	from			20	“Italiaansch Boeknieuws”, <i>Boekzaal van Europe</i> , July and August 1697
L-323	6 June 1697	to		185	12	in Latin; marine fossils in the mountains; sent copies of <i>Continuatio Arcanorum Naturae</i> (Continuation of nature’s secrets)
L-326	August 1697	from			20	“Italiaansch Boeknieuws”, <i>Boekzaal van Europe</i> , September and October 1697

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L-#			AvL #	CL #	CL vol	
L-330	2 November 1697	to		189	12	thanks for two recent letters; complains that a book sent to him, <i>Saggi di naturali esperienze</i> (Essays of natural experiences), has not arrived
L-332	late 1697 – early 1698	from			20	“Italiaansch Boeknieuws”, <i>Boekzaal van Europe</i> , January and February 1698
L-336	20 February 1698	to		191	12	in Latin; problems during the transport of <i>Saggi di naturali esperienze</i>
L-337	March 1698	from			20	sends a poem from a poet, neither identified
L-342	17 April 1698	to		192	12	thanks for the poem; <i>Saggi di naturali esperienze</i> has at last arrived and has received a place of honour in L.’s house
L-344	June 1698	from			20	“Italiaansch Boeknieuws”, <i>Boekzaal van Europe</i> , September and October 1698
L-346	14 August 1698	to		194	12	in Latin; cover letter for catalogue of art collection of Mennonite minister A. VAN BEUSECOM; details of payment for <i>Saggi di naturali esperienze</i>
L-350	late 1698	from			20	“Italiaansch Nieuws”, <i>Boekzaal van Europe</i> , January and February 1699
L-354	28 February 1699	to		198	12	in French; restitution of the money L. paid to receive <i>Saggi di naturali esperienze</i>
L-359	8 September 1699	from			20	“Italiaansch Boeknieuws”, <i>Boekzaal van Europe</i> , September and October 1699
L-363	16 October 1699	to	121	206	12	in Latin; tiny animals in ditch water; <i>cyclops</i> ; opposes spontaneous generation; animals are created as food for each other

## APPENDICES

L-#			AvL #	CL #	CL vol	
L-381	mid-1701	from			20	“Italiaansch Nieuws”, <i>Twee maandelijke uittreksels</i> , September and October 1701
L-435	before 12 March 1705	from			20	sending a book; showed L.’s last letter about silver and diamonds to important religious and political people in Florence and Rome; book news, never published
L-436	12 March 1705	to		256	15	diamonds; crystallization of silver out of a solution in aqua fortis; silver sulphate crystals
L-465	10 July 1708	from			20	last book news, never published

### Appendix 7. Richard Waller Correspondence (1692-1714)

Nine letters from WALLER to L. from 1692 to 1714.

Seven letters to WALLER from L. from 1692 to 1694.

See also the Remarks to Letter L-215 of 12 February 1692, in this volume.

L-#			AvL #	CL #	CL vol	
L-215	12 February 1692	from		no #	8 and 20	acknowledges letters from L.; comments on subjects in those letters about air in blood, opening of chyle-vessels into the intestine; stones in the bladder; structure of a grass-spikelet
L-217	22 April 1692	to	72	120	9	experiments with air-pump to investigate air in water and blood; fermentation of blood; chervil and currant seeds, stones, and hog's hair in urine; pericarp and seed-coat of a wheat grain
L-224	8 May 1693	from		no #	9	microscopical structure of a feather; supports univocal generation
L-225	1 July 1693	to		125	9	confirms the receipt of a letter; dispatch of a volume of letters in Latin, probably <i>Continuatio Epistolarum</i> (Continuation of the letters)
L-230	8 December 1693	to		128	9	dispatch of letters about flea procreation; a noxious worm; mite; printing of letters
L-232	19 January 1694	to		130	9	cover letter for Letter 129 [77] L-231 of 20 December 1693 to the Society
L-234	10 February 1694	from		no #	9	acknowledges two letters from L.; requests research on the colours of bird feathers and sperm in bird eggs
L-235	12 February 1694	to		132	9	cover letter for Letter 131 [78] L-233 of 24 January 1694 to the Society

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L-#			AvL #	CL #	CL vol	
L-243	2 May 1694	from		no #	10	introduces a Mr. WALFORD, who brought issues of <i>Philosophical Transactions</i> ; the Society is satisfied with recent observations
L-244	26 May 1694	to		138	10	acknowledges WALLER's letter of 22 April 1694 O.S.; visit of WALFORD; dispatch of <i>Vierde Vervolg der Brieven</i>
L-245	14 September 1694	to	84	139	10	sent a number of copies of his portrait to the Society; blood in the leg of a young crab
L-502	3 March 1714	from			20	resumes writing to L. 20 years after his previous letter; discusses L.'s recent letter about muscles and adds his own ideas about insect muscles
L-503	8 March 1714	from				writing for the Society <sup>1</sup> , graciously expresses its pleasure in having received L.'s recent letter about muscle fibers; sends some issues of <i>Philosophical Transactions</i>
L-505	19 July 1714	from			20	writes about how the Society received L.'s recent observations; asks L. to examine insect muscles; the Society has several members to translate his letters; promises to send the most recent volume of the <i>Philosophical Transactions</i> .
L-506	27 July 1714	from			20	notes the receipt of L.'s latest letter; thanks for ongoing communication with the Society; will publish whatever L. sends and will get issues of the <i>Philosophical Transactions</i> to him as soon as possible

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<sup>1</sup> From the Royal Society but probably written by WALLER.



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L-#		AvL #	CL #	CL vol	
L-508	30 August 1714	from		20	acknowledges the receipt of L.'s latest letter; thanks L. for his observations on the texture of muscles; regrets that official thanks will have to wait until October because of the Society's annual recess

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### Appendix 8. Pieter Rabus Correspondence (1693-1696)

Five letters from RABUS to L. from 1693 to 1696. Three were published in *De Boekzaal van Europe*.

Seven letters to RABUS from L. from 1693 to 1696. All of them were published in *De Boekzaal van Europe*. Only one of these letters was published by L. himself, Letter 140 [85] L-246 of 30 November 1694, in *Arcana Natura Detecta* (The secrets of nature revealed, 1695) and *Vijfde Vervolg der Brieven* (Fifth continuation of the letters, 1696).

See also the Remarks to Letter L-250 of May 1695, in this volume.

L-#			CL #	CL vol	
L-226	18 August 1693	from		9	long rhyming panegyric on L.'s character and accomplishments; encourages him to complete his investigation of procreation of fleas; request to publish it; <i>Boekzaal van Europe</i> , July and August 1693
L-229	27 October 1693	to	127	9	procreation of fleas, leather jackets, and mites; <i>Boekzaal van Europe</i> , November and December 1693
L-246	30 Nov. 1694	to	140	10	dragonfly: eyes and cornea, comparison with crab eyes, blood vessels in intestines, number of eggs; comparison with vertebrates' corneas; rejection of spontaneous generation; impregnation of women; <i>Boekzaal van Europe</i> , November and December 1694
L-250	May 1695	from		20	a pleasant letter, subject and exact date unknown
L-254	21 May 1695	to	145	10	eggs and blood vessels of the ray; <i>Boekzaal van Europe</i> , May and June 1695
L-258	21 June 1695	from		20	asks for L.'s comments on a letter about caterpillars growing in a woman's ears
L-263	21 July 1695	to	150	11	doubts that a large caterpillar emerged from a woman's ear; advice for expelling vermin from ears by fumigation with sulphur; cannot find any mites in his own ear; <i>Boekzaal van Europe</i> , July and August 1695
L-270	10 September 1695	to	156	11	tries to breed maggots with his own ear wax as food; movement in his ear due to vibration of a little hair against the eardrum; <i>Boekzaal van Europe</i> , September and October 1695

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L-#			CL #	CL vol	
L-288	16 May 1696	from		11	visit by dowser CORNELIS VAN BEUGHEM and his son, who demonstrated the action of a divining rod; <i>Boekzaal van Europe</i> , May and June 1696
L-289	1 June 1696	to	166	11	divining rod attracted by gold; comparison with iron and loadstone; vessels in a hazel divining rod; <i>Boekzaal van Europe</i> , May and June 1696
L-297	23 July 1696	to	171	12	honeydew, which comes from trees, is a sweet, syrupy substance; lime trees have more honeydew than other trees have; moisture from vine tendrils suggests a theory on the production of lacquer in tropical trees; friend in Delft has lost the capacity to handle the divining rod; <i>Boekzaal van Europe</i> , July and August 1696
L-298	30 July 1696	from		12	expresses satisfaction that L. has made it plausible that honeydew does not fall from the air; the continuing ability of RABUS's wife to trace gold and silver with a divining rod; <i>Boekzaal van Europe</i> , July and August 1696

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### Appendix 9. Frederik Adriaan van Reede Correspondence (1695-1717)

Three letters from VAN REEDE to L. in 1695 and 1696.

Fourteen letters to VAN REEDE from L. from 1695 to 1717.

See also the Remarks to Letter L-249 of May 1695, in this volume.

L-#			AvL #	CL #	CL vol	
L-248	22 April 1695	to	87	142	10	apple-blossom weevil, its larvae, their injuriousness and metamorphosis; reproduction of black flies on apple tree blossoms
L-249	May 1695	from			20	pleased with L.'s observations about apple blossom weevils and black flies on apple blossoms
L-253	18 May 1695	to	89	144	10	reproduction of apple blossom weevil, its head and legs; caterpillars and the metamorphosis of the small ermine moth, its ichneumon fly parasites; head and the wing of the ichneumon fly
L-257	June 1695	from			20	pleased with L.'s further observations about garden pests
L-260	10 July 1695	to	90	147	10	curling of leaves of different trees caused by aphids, not ants; aphids in the bodies of the mother animals; shedding of aphid skin; winged aphids generated from wingless ones; several species of aphids on different trees; aphids are born abdomen foremost; larvae of parasites found on some aphids, and their development into a separate species of 'little flies'; futile search for male aphids
L-264	15 August 1695	to	92	151	11	shape and size of oyster larvae from adult specimens; large number of larvae from one mother oyster; oysters not produced by spontaneous generation; radula of the periwinkle (sea snail)

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L-#			AvL #	CL #	CL vol	
L-268	20 August 1695	to	94	155	11	oyster larvae; search in vain for oyster sperm; aphids on a rose bush are viviparous; differ from the mealy plum aphids; larvae of hymenopterous parasites in the aphids, on the eggs; little animals on cherry trees also have parasites
L-281	December 1695	to		161	11	dedication of <i>Vijfde Vervolg der Brieven</i> (Fifth continuation of the letters)
L-285	20 February 1696	to	98	164	11	body louse, its sexual organs; rapid multiplication of lice; opposes JOHANNES JONSTON's and ATHANASIUS KIRCHER's observations of lice
L-296	16 July 1696	to	103	170	12	male and female sexual organs of oysters; oyster larvae
L-299	23 August 1696	from			20	writes to L. about unspecified topics
L-300	26 August 1696	to	104	172	12	many lice, with and without wings, on lime tree leaves; plant lice embryos; parasitization of plant lice; black flies are not born in ditch water; associates caterpillars on apple trees with black flies found there; vain attempts at caterpillar pupation; English oysters planted near Zierikzee did not contain any young; tasted excellent
L-368	2 June 1700	to	125	211	13	eyes, mouth parts, food, intestines, and eggs of a shrimp
L-383	9 February 1701	to		222	13	willow wood pores; advice for improving peat
L-393	26 August 1701	to	141	229	14	accurate instrument for measuring the fall of water; invention of a level
L-525	some years before 1716	to			20	details about the large number of eggs in the roe of a ling
L-558	10 September 1717	to	XLII		18	haddock intestines, roach and cod, scales determine the age of herring, perch, bream, cod

## APPENDICES

### Appendix 10. Hans Sloane Correspondence (1696-1713)

Twenty-one letters from SLOANE to L. from 1696 to 1713.

Sixteen letters to SLOANE from L. from 1697 to 1713. Eight of them were published in the *Philosophical Transactions*.

See also the Remarks to Letter L-311 of 18 December 1696, in this volume.

L-#			AvL #	CL #	CL vol	
L-284	17 February 1696	from			20	writing for the Society <sup>2</sup> , sends a courteous, encouraging letter with reference to a letter L. never received
L-311	18 December 1696	from			20	conveys the Society members' courtesies
L-315	19 February 1697	to		182	12	will send soon to be published work to the Society; requests latest <i>Philosophical Transactions</i> and recent work of MALPIGHI
L-316	25 March 1697	to		183	12	lost cover letter <sup>3</sup> for <i>Continuatio Arcanorum Naturae</i>
L-360	25 September 1699	to		203	12	cover letter for Letter 204 [119] L-361 to the Society of same date; requests a reaction to previous letters
L-364	2 January 1700	to	122	207	13	liver fluke; larvae of gnats; green algae; circulation of blood in a frog, micro-organisms in its faeces
L-369	8 June 1700	from			13	expresses thanks for two letters sent by L.; points out problems of translation in London; asks for an examination of parasitic worms
L-370	14 June 1700	to	127	212	13	sperm of many animals; if the Society would like him to investigate any animal, he will do so

<sup>2</sup> From the Royal Society but probably written by SLOANE.

<sup>3</sup> The manuscript is lost and no copy was made, but the Royal Society's Journal Book Original, vol. 10, p. 39 notes that the letter was read aloud at the meeting on 23 June 1697 O.S. See the Remarks to Letter L-063 from HOOKE to L. of 10 December 1677, in this volume.

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L-#			AvL #	CL #	CL vol	
L-372	9 July 1700	to	128	214	13	blood circulation in flounder; red blood corpuscles of flounder and salmon, their oval form, and the way they change shape to pass through capillaries; blood vessels; sperm of a young cock
L-374	15 July 1700	from			20	forwards three larvae from JOHN CHAMBERLAYNE that came from a decayed tooth <sup>4</sup> ; tells L. that the Society is sending him a book
L-375	27 July 1700	to	130	216	13	larvae of cheese-flies; cheese-flies and sulphur; treatment of toothache with vitriol
L-377	7 September 1700	to	132	218	13	larvae of cheese-flies
L-378	26 October 1700	to	134	219	13	black flies on fruit trees; aphids; comparing sperm to the parthenogenetic procreation of aphids; development of the pupae of moths
L-379	29 November 1700	from			20	writes courteously that L.'s recent letters are welcome to the Society
L-380	25 December 1700	to	135	220	13	ram sperm; objections to NICOLAAS HARTSOEKER's claim to have discovered sperm first in 1678; L. had written to the Society about sperm in 1677
L-382	28 January 1701	to	136	221	13	sawfly larvae in gall-nuts on willow leaves; larvae of parasitical ichneumon-fly
L-387	24 April 1701	from			20	encloses Letter L-386 of 24 April 1701 from JOHN CHAMBERLAYNE and introduces him as the person now translating L.'s letters into English
L-388	20 May 1701	from			20	writes courteously that L.'s recent letters are translated, read to the Society, and published in <i>Philosophical Transactions</i>

<sup>4</sup> See Letter L-430 of 2 December 1704, dated 21 November O.S., from JOHN CHAMBERLAYNE to L., in this volume.

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L-#			AvL #	CL #	CL vol	
L-391	21 June 1701	to	139	227	13	quality of his lenses; cornea, blood vessels, and crystalline humour of his own eye
L-394	27 September 1701	from			14	thanks for recently received letters; a personal thanks for the bequest of 26 microscopes to be received after L.'s death
L-396	18 November 1701	from			14	another thanks for the bequest of 26 microscopes; reference to the lost Letter L-395 of 15 November 1701 of thanks from Society president JOHN SOMERS
L-397	6 December 1701	to		230	14	cover letter to Letter 231 [142] L-398 of the same date to Society president JOHN SOMERS
L-402	before April 1702	from			20	writes an introduction for JAMES VERNON to present when he visits L.
L-411	November 1703	from			20	cover letter to a book on silver mines as well as numbers of <i>Philosophical Transactions</i>
L-412	3 November 1703	to		242	14	cover letter for Letter 243 L-413 of the same date; thanks for recent <i>Philosophical Transactions</i> and a book on mines in Peru
L-421	between March and July 1704	from			20	writes that he is pleased with L.'s recent discoveries; requests that L. continue his research; to send seven numbers of <i>Philosophical Transactions</i>
L-429	2 December 1704	from			20	encloses Letter L-430 of the same date from JOHN CHAMBERLAYNE and a piece of ash for L. to examine
L-432	13 February 1705	from			20	writes that recent letters were translated into English and read with great pleasure; adds the Society's wishes for a long and healthy life
L-440	10 November 1705	from			20	writing for the Society <sup>4</sup> , tells L. that several letters have been translated, printed in <i>Philosophical Transactions</i> , and sent to him



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L-#			AvL #	CL #	CL vol	
L-451	4 May 1707	from			20	introduces a visitor, GILBERT BURNET; notes L. has not written to the Society for a long time
L-453	3 June 1707	from			20	writing for the Society, accounts for L.'s recent letters; assures him his letters are always welcome; the most recent translated, printed in <i>Philosophical Transactions</i> , and sent
L-460	4 November 1707	from			20	writing for the Society, says that two recent letters will be printed; figures for an earlier letter are missing; encloses a hairy substance for L. to investigate
L-466	before 28 August 1708	from			20	writing for the Society, tells L. that recent letters have been received with pleasure and read to the attentive members
L-470	10 September 1709	to		279	16	cover letter for Letter 280 L-471 of the same date to JOHN CHAMBERLAYNE
L-473	late 1709	from			20	introduces a visitor, ALEXANDER STUART, as a curious world traveler
L-499	12 October 1713	to		304	17	cover letter to copy of letter to HEINSIUS on muscle fibres of a whale; asks SLOANE for new issues of <i>Philosophical Transactions</i> and a list of fellows of the Society
L-500	24 October 1713	from			20	acknowledges receipt of latest letter; reassures him that the Society appreciates his letters; believes that <i>Philosophical Transactions</i> were sent

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### Appendix 11. Gottfried Leibniz Correspondence (1697-1716)

Five letters from LEIBNIZ to L. from 1697 to 1716.

Seven letters to LEIBNIZ from L. in 1715 and 1716.

L-#			AvL #	CL #	CL vol	
L-312	1697	from			20	replies to L.'s observations about magnets; speculates about magnets and the magnetic power of the Earth
L-520	5 August 1715	from		316	17	the different opinion of Italian physician ANTONIO VALLISNIERI about sperm; LEIBNIZ shares L.'s views, as published in his recent <i>Essais de Théodicée</i> ; hopes that L. will continue with publication of his <i>Send-Brievien</i> ; also hopes that L. will encourage young people to research with the microscope; asks L.'s opinion about a book by NICOLAAS HARTSOEKER
L-521	28 Sept. 1715	to	XVIII	317	17	list of scholars who agree and disagree with L.'s theory of sperm's role in reproduction; sperm of different kinds of fish have the same size; the pulse; new letters will be printed after his death; refuses to agree to LEIBNIZ's request to start a school for lens grinders; summary of a letter to the Society on muscle fibres and tendons; refuses to read HARTSOEKER; acknowledges once more his inability to observe cavities in nerves
L-522	29 Oct. 1715	from		318	17	Italian doctor ANTONIO VALLISNIERI opposes L.'s views on sperm; HARTSOEKER not as good an observer as he claims to be; two visitors; appeals to L. to describe the advantages of the microscope; the incorrect notion that scientific research does not yield any financial rewards; L.'s anatomical observations, and his views about, among other things, membranes

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L-#			AvL #	CL #	CL vol	
L-523	18 Nov. 1715	to		319	17	cover letter to Letter 320 [XIX] L-524 of the same date
L-524	18 Nov. 1715	to	XIX	320	17	vessels in the flesh of fruit and in the seeds of various strains of pears; embryo in a pear; structure of a pear's skin; spiral vessels in tea leaves
L-527	3 March 1716	to	XX	322	17	rare occurrence of twins in certain animals; in trees too, in general only one seed develops into a mature tree; the difference in the number of young in nidifugous and nidicolous birds; L. does not want to be paid for his research, nor does he want to teach students; sperm from big and small animals are about the same size; number of eggs in fishes' hard roe; viviparous fish produce only a few young; structure of tendons and muscle fibres; the functioning of the heart
L-528	31 March 1716	from		323	17	thanks L. for some sketches, sent earlier; the function of membranes, their sensitivity, and the influence of heat and cold on their functioning; multiple births in humans and other animals; has shared information from L. with other scholars; the views of other microscopic researchers on the question of reproduction
L-532	19 May 1716	to	XXIII	326	17	enumeration of some research questions: structure of muscle fibres in muscles and tendons; number of teats on mammals; number of spermatozoa; no eggs in ovaries, fallopian tube, or womb; cannot imagine how the fallopian tube could bring about suction; does not know what function the ovary has.

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L-#			AvL #	CL #	CL vol	
L-539	25 Sept. 1716	from			18	has forwarded L.'s letter about the ovaries in animals to two doctors in Leipzig
L-545	17 Nov. 1716	to	XXX		18	responds to the ideas of various German authors about reproduction; emphasizes the role of sperm by discussing why animals have so many sperm and why trees, such as currant trees, have so many seeds; denies that ovaries are really egg nests because the fallopian tube is too small to let eggs through to the womb; female reproductive organs of a sheep and testicles of a ram support this view

## Appendix 12. John Chamberlayne Correspondence (1701-1709)

Five letters from CHAMBERLAYNE to L. from 1701 to 1709.

Seven letters to CHAMBERLAYNE from L. from 1701 to 1709.

Five of them were published in the *Philosophical Transactions*.

See also the Remarks to Letter L-386 of 24 April 1701, in this volume.

L-#			CL #	CL vol	
L-386	24 April 1701	from		20	asks L. to explain why, when he was in Holland, the taste of water changed depending on how long it was boiled; also asks whether L. has studied razors microscopically to explain why steel razors are spoiled by extreme heat and cold
L-389	21 June 1701	to	225	13	salt crystals in rain-water; notches in a knife
L-406	12 September 1702	from		20	describes in detail a friend's dental problems as well as his dental hygiene practices; references L.'s Letter 98 [53] L-186 of 4 April 1687 about elephant teeth; encloses one of the teeth that fell out of his friend's mouth and asks L. not only to reply, but whether CHAMBERLAYNE can publish the reply for the benefit of mankind; also asks a general question about what observations L. has published in the previous two years
L-407	8 December 1702	to	238	14	dental hygiene; recommends teeth polishing with salt and tobacco ash; tea and coffee not harmful to teeth
L-427	3 October 1704	to	251	15	tobacco ash and the salt crystals from it; oily substance produced by heating tobacco ash
L-430	2 December 1704	from		20	recent remarks on tobacco ash pleased him; at dinner with the archbishop of Canterbury and the bishop of Salisbury, he learned about a burned haystack,

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L-#			CL #	CL vol	
					the ashes of which were a light solid substance; gave a sample to HANS SLOANE, who enclosed it in a separate letter to L., Letter L-429 of the same date
L-434	3 March 1705	to	255	15	examination of vitrified matter which had come into being after hay in a haystack caught fire
L-450	31 March 1707	from		20	inquires after L.'s health, especially because for such a long time the Society has not heard from L. about his health
L-452	17 May 1707	to	267	15	sent several letters to the Society without a response; bezoar stone found in the stomach and intestines of animals
L-469	13 August 1709	from		20	inquires again about razors and the effects of cold weather on their performance
L-471	10 September 1709	to	280	16	the edge and nicks of a razor; on the setting and maintenance of a razor
L-472	22 November 1709	to	281	16	his head and facial hair; cod muscle compared to the width of a single strand of hair; grey hair of a 50-year-old man and another man

### Appendix 13a. James Jurin Correspondence (1722-1723)

Five letters from JURIN to L. in 1722 and 1723.

Seven letters to JURIN from L. in 1722 and 1723.

Four of them were published in the *Philosophical Transactions*.

See also the Remarks to Letter L-571 of 5 March 1722, in this volume.

L-#			CL vol	
L-571	5 March 1722	from	19	introduces himself as the new secretary of the Society; expresses admiration for L.'s work
L-574	1 May 1722	to	19	asks for support for his observations of partheno-genetic animals, which people find hard to believe; follows up on the parcel of <i>Philosophical Transactions</i> that JURIN sent to him
L-575	26 May 1722	from	19	thanks L. for his two last letters; asks L. to translate his letters into Latin because many of the letters he had sent in Dutch remained untranslated during the editorship of his predecessor, EDMOND HALLEY; is now translating these earlier letters; passes along the request of HANS SLOANE for L. to investigate smallpox pustules for traces of insects
L-577	13 June 1722	to	19	no one whom L. knows in Delft can translate L.'s letters into Latin, as JURIN requested; doubts that inoculations protect against smallpox, using his daughter's experience as an example; promises to investigate HANS SLOANE's question about whether there are little animals in scabrous skin; returns greetings of JOHN CHAMBERLAYNE; adds postscript about sending future numbers of <i>Philosophical Transactions</i> via a Rotterdam merchant
L-579	7 July 1722	to	19	cover letter to L.'s Letter L-578 of the same date to the Society; no microorganisms are to be found in the pustules of smallpox patients
L-580	12 October 1722	from	19	L.'s ideas about pocks are acceptable to the Society
L-581	20 Nov. 1722	to	19	microscopic structure of diamonds and rock crystal
L-582	4 January 1723	from	19	thanks L. for his most recent letter on diamonds and especially for sending his recent letters already translated into Latin; method for measuring microscopic objects, such as blood globules; asks L. to try to replicate his results using his measurement method

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L-#		CL vol		
L-584	19 March 1723	to	19	blood; calculations of the size of blood globules; the state of his health; the role of the ovary in reproduction
L-586	6 July 1723	from	19	introduces a MR RAPER, delivering the letter, who would like to witness some of L.'s observations; thanks L. for his observations on the size of blood globules; asks L. to study them further; L.'s work led to a new theory of generation, but anatomists use his observations to support the old theory; L.'s health
L-587	August 1723	to	19	similarities between globules in blood and in the lees of wine to argue against JURIN's hope to discover how blood globules are made
L-588	August 1723	to	19	his spermist view of the generation of animals; palpitations of his diaphragm; a glass device he designed to treat his condition, which killed him



### Appendix 13b. James Jurin correspondence after L.'s death (1723-1724)

Six letters from JURIN to PETRUS GRIBIUS, MARIA VAN LEEUWENHOEK, and ARNOUT VAN DEN BERCH.

Three letters from PETRUS GRIBIUS and JOHANNES HOOGVLIET to JURIN.

L-#				CL #	CL vol	
L-589	30 August 1723	from	PETRUS GRIBIUS	378	19	circumstances surrounding the death of L.; his bequest of microscopes to the Society, soon to be sent by L.'s daughter MARIA
L-590	4 Sept. 1723	from	JOHANNES HOOGVLIET	379	19	cover letter, informing Jurin of the circumstances surrounding the enclosed Letter L-587 and Letter L-588, both dated August 1723; on L.'s deathbed request, HOOGVLIET translated them into Latin
L-592	4 Oct. 1723	from	PETRUS GRIBIUS	381	19	eulogises L.; asks Jurin not to refuse a little present, the cabinet of microscopes that L. bequeathed to the Society
L-593	12 Oct. 1723	to	PETRUS GRIBIUS	382	19	laments L.'s death and, in response to GRIBIUS's request, encourages L.'s daughter to send the microscopes that her father bequeathed to the Society
L-596	29 Nov. 1723	to	MARIA VAN LEEUEWENHOEK	385	19	thanks her for sending her father's bequest to the Society
L-597	29 Nov. 1723	to	ARNOUT VAN DEN BERCH	386	19	thanks him for the safe delivery of the cabinet of microscopes to the Society
L-598	29 Nov. 1723	to	PETRUS GRIBIUS	387	19	thanks him for the safe delivery of the cabinet of microscopes to the Society
L-600	13 June 1724	to	ARNOUT VAN DEN BERCH	388	19	a Captain Taylor will deliver two books and a silver bowl as a present from the Society to MARIA VAN LEEUWENHOEK
L-601	13 June 1724	to	MARIA VAN LEEUEWENHOEK	389	19	presents her with the two most recent volumes of <i>Philosophical Transactions</i> , which contain letters by her father; the Society also presents her with a plate engraved with their arms in memory of her father

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### Appendix 14. Editors and Leeuwenhoek Commission (1931-2024)

In 1931, the Royal Academy of Sciences and the editor of *Het Nederlandsch Tijdschrift voor Geneeskunde* (the Dutch journal of medicine) resolved to prepare a complete critical edition of Leeuwenhoek's letters, in commemoration of the tercentenary of his birth in 1932. To this purpose a commission was formed; its 12 members are the first names on the list below. Since then, many other scholars have served, ordered here by the year they joined the Commission<sup>5</sup>:

#### I. The Leeuwenhoek Commission (1931-2016)

##### *A. Founding members*

G. VAN RIJNBERK	1931-1953, chair 1931-1953
M.A. VAN ANDEL	1931-1941
J. BOEKE	1931-1956
M. VAN EIJSDEN, NÉE VAN RIJNBERK	1931-1957, assistant secretary 1931-1957
F.M.G. DE FEYFER	1931-1950
G.C. HERINGA	1931-1972, editor, vol. I, II
F.M. JAEGER	1931-1945
A.J. KLUYVER	1931-1956, secretary-treasurer 1931-1952, chair 1955-1956
E.C. VAN LEERSUM	1931-1938, deputy chair 1931-1938
H.F. NIERSTRASZ	1931-1937
A. SCHIERBEEK	1931-1959, editor, vol. III-V
J.C. SCHOUTE	1931-1942

##### *B. Later members*

G. VAN ITERSON JR., 1940-1963	
H. ENGEL	1946-1981
H.W. VAN SETERS	1951-1976
J.A. BARGE	1952
J.A. BIERENS DE HAAN	1947-1958, secretary-treasurer ~1952-1958
J.W. DUYFF	~1952-1961
W. KOUWENAAR	1952-1954, deputy chair 1952-1954
D. SCHOUTE	1952-1953
R. HOOYKAAS	1954-1981
H.W. JULIUS	1954-1971, chair 1956-1971
M. ROOSEBOOM	1954-1971
J.R. PRAKKEN	1955-1970
F. VERDOORN	1958-1981, secretary-treasurer 1960-1981
A. KLEINHOONTE	1959-1960, secretary 1957-1960
J. LANJOUW	1959-1980
G.A. LINDEBOOM	1961-1981, chair 1961-1981
W.K.H. KARSTENS	1963-1981

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<sup>5</sup> For two overviews of the process of the Commission, see FOURNIER (1990), "Zo Leeuwenhoek, zo Leeuwenhoek-Commissie" and PALM (2005), "The Edition of Leeuwenhoek's Letters: Changing Demands, Changing Policies".

**I. The Leeuwenhoek Commission*****B. Later members (continued)***

J. DANKMEIJER	1965-1973
P. SMIT	1968-1986, supervision of the editorial work
A.J.F. GOGELIN	1971-1986
M.A. DONK	1972, chair 1972
H.A.M. SNELDERS (*)	1973-, secretary-treasurer 1975-1991, chair 1991-2016
F.A. STAFLEU	1973-1991, chair 1986-1991
B.C. DAMSTEEGT (*)	1975-2003
L.B. HOLTHUIS (*)	1980-2008
A.M. LUYENDIJK-ELSHOUT	1980-1992
P. BAAS (*)	1981-2016
G.A.C. VEENEMAN (*)	1986-2016
R.P.W. VISSER (*)	1986-, secretary-treasurer 1991-2016
J.D. NORTH (*)	1991-2008
H. BEUKERS (*)	1992-2016
A. KETS-VREE (*)	1994-2016

In 1994, the Leeuwenhoek Commission was transformed into a project commission within the *Constantijn Huygens Institute* (now the *Huygens Institute* of the KNAW (Royal Netherlands Academy of Arts and Sciences)). The members of this project commission are marked here with an asterisk. The commission officially ceased to exist in 2016.

**C. Chairs of the Leeuwenhoek Commission**

G. VAN RIJNBERK	1931-1953, vols. 1-4 Preface
A.J. KLUYVER	1955-1956
H.W. JULIUS	1956-1971, vols. 5-8 Preface
M.A. DONK	1972
G.A. LINDEBOOM	1976-1981, vols. 9-11 Preface
F.A. STAFLEU	1986-1991, vol. 12 Preface
H.A.M. SNELDERS	1991-2016, vols. 13, 14 Preface

**D. 1931 Editorial Commission**

G. VAN RIJNBERK	1931-1953, chair
G.C. HERINGA	1931-1952, editor, vol. 1, 2
A. SCHIERBEEK	1931-1959, editor, vol. 3-6
M. VAN EIJDEN, NÉE VAN RIJNBERK	1931-1957, assistant secretary
J.I.H. MENDELS	1931-1947, assistant secretary

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### II. Editors of the *Collected Letters*

jaar year	vol.	no. ltrs	letters	years	editor
1939	1	21	1 [1] – 21 [14]	1673- 1676	C.G. HERINGA
1941	2	21	22 [15] – 42 [27]	1676- 1678	C.G. HERINGA
1948	3	27	43 [28] – 69	1679- 1682	A. SCHIERBEEK (after 1942)
1952	4	12	70 [37] – 81 [42]	1683- 1684	A. SCHIERBEEK
1957	5	8	82 [43] – 89 [48]	1685- 1686	A. SCHIERBEEK
1961	6	12	90 [49] – 101 [56]	1686- 1687	A. SCHIERBEEK, J.J. SWART
1964	7	8	102 [57] – 109 [64]	1687- 1688	J.J. SWART
1967	8	10	110 [65] – 119 [71]	1688- 1692	J.J. SWART
1976	8	14	120 [72] – 133 [79]	1692- 1694	J. HENIGER
1979	10	14	134 [80] – 147 [90]	1694- 1695	L.C. PALM
1983	11	22	148 – 169 [102]	1695- 1696	L.C. PALM
1989	12	37	170 [103] – 206 [121]	1696- 1699	L.C. PALM
1994	13	21	207 [122] – 227 [139]	1700- 1701	L.C. PALM
1996	14	21	228 [140] – 248	1701- 1704	L.C. PALM
1999	15	21	249 – 269	1704- 1707	L.C. PALM
2014	16	25	270 - 294	1707- 1712	L.C. PALM
2018	17	34	295 – 327 [XXIV]	1712- 1716	L.C. PALM, H.J. ZUIDERVAART, D. ANDERSON, E.W. ENTJES
2023	18	31	L-533 – L-563	1716- 1717	D. ANDERSON, L.C. PALM, H.J. ZUIDERVAART
2023	19	37	L-564 – L-601	1720- 1724	D. ANDERSON, L.C. PALM, H.J. ZUIDERVAART
2023	20	193	L-004 – L-529	1674- 1716	D. ANDERSON, L.C. PALM, H.J. ZUIDERVAART, E.W. ENTJES

**III. Translators**

A. SWAEN,	Vol. 1 through vol. 4, though he passed away before finishing.
A. QUERIDO,	Fourteen letters in vol. 1 and vol. 2.
M. BUNNEMEIJER	The final letter in vol. 4, Letter L-150 81 [42] of 25 July 1684 to the Royal Society.
M. HOLLANDER	The first letter in vol. 5, Letter L-152 82 [43] of 5 January 1685 to the Royal Society.
E. VAN LOO	Vol. 5 through vol. 8. For vol. 6, he had help from J.W. DUYFF with the technical terms in Letter L-173 90 [49], Letter L-175 92 [50] and Letter L-177 93 [51], all to the Royal Society and from H. NICHOL for the final revision of Letter L-178 94 [52], Letter L-186 98 [53], Letter L-187 99 [54], Letter L-188 100 [55], and Letter L-189 101 [56], all to the Royal Society.
C. DIKSHOORN	Vol. 9 through vol. 15, thus translating more letters than any of the other translators.
E. KEGEL-BRINKGREVE	Letter L-384 223 of 8 April 1701 in vol. 13; vol. 16, vol. 17; draft translations for vol. 18 and vol. 19.
LEO NELLISSEN	Letter L-066 of 11 January 1678.
MAURITS VAN WOERCOM	Letters L-101 of 7 March 1680 and L-589 of 29 August 1723.
HENK J.M. NELLEN	Letter L-338 OF 21 March 1698.
DOUGLAS ANDERSON	Final translations for vol. 18, vol. 19 and all translations for vol. 20.

**IV. Transcribers**

J.I.H. MENDELS	made the transcriptions and wrote the explanatory linguistic notes through Letter L-154 83 [44] of 23 January 1685 to the Royal Society, vol. 5.
BOUDEWIJN C. DAMSTEEGT	made the transcriptions and wrote the explanatory linguistic notes for the rest of vol. 5 and all of vol. 6 through vol. 19.
DOUGLAS ANDERSON	made the transcriptions for vol. 20.

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### Appendix 15. Contemporary Dutch and Latin Editions of L's Letters

LEEUVENHOEK's letters were published in pamphlets of one or several letters each in the mid-1680s and collected volumes with anywhere from 7 to 46 letters every couple of years beginning in 1687, for a total of 165 letters. They were published in 27 first editions and an additional 20 second and third editions. The trend was toward increasing size and uniformity. In his late 80s, L. attempted to assemble a complete works, called *Werken* or *Brieven* in Dutch and *Opera Omnia* in Latin. Yet even as that project was being completed in 1722 with letters through 1717, he had another dozen letters published in the *Philosophical Transactions*. When Leeuwenhoek died, he had the – now lost – manuscripts, translations, and plates ready for another volume that never got published. This is known from the 1747 auction catalogue of L.'s microscopes,<sup>1</sup> at the end of which can be read:

*Text in Dutch:*

In den Boedel van wylen Juffr. MARIA VAN LEEUVENHOEK zyn gevonden eenige nagelaten Manuscripten of Brieven van haar vader den Heer ANTH: VAN LEEUVENHOEK, dewelke door zyn Ed: in deszelfs Leven geschreven en in eene nette en goede ordre geschikt zyn om als een vervolg op zyne voorgaande uitgegeve Brieven gedrukt te konnen werden. Alle de Platen daar toe behoorende zyn daarby en reeds in 't koper gegraveert, zoo als ook de Latynsche Vertaling van voorsz. Brieven. Iemand genegen zynde dit Werk te kopen, om het als een vervolg op zyne reeds uitgegevene Brieven te laten drukken, kan zich adresseeren aan de Executeurs van de voorsz. Boedel.

*In English translation:*

In the estate of the late Miss MARIA VAN LEEUVENHOEK has been found some left-behind manuscripts or letters from her father, Mr. ANTHONY VAN LEEUVENHOEK, which his honour wrote during his life and arranged in a neat and good order, destined to be printed as a continuation to his preceding published letters; All the plates, belonging to this work are present, and already engraved in copper, as are the Latin translations of the letters. Someone willing to buy this work, in order to print this as a continuation to his already published letters, can address himself to the executors of the aforementioned estate.<sup>2</sup>

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<sup>1</sup> See Rees, *Catalogus*. These unpublished papers and copper plates are also mentioned in the inventory of MARIA LEEUVENHOEK's estate of 15 September 1746, on fol. 187vs: "Het cabinet van vergrootglaasen, mitsgaders de nog ongedrukte brieven met de vertaaling daarvan in 't Latijn, leggende in een houte doos, met 11 groote en 1 kleijne kopere plaat daartoe, met het silvere plaatje, sijnde alsnog onverkogt gebleeven' [...]; fol. 224: 'zijnde dezelve in bewaring genomen bij Mr. WILLEM VAN DER LELY". ("The cabinet of magnifying glasses, as well as the unprinted letters with their translation into Latin, placed in a wooden box, with 11 large and 1 small copper plate thereto, with the silver plate, having remained unsold as yet' [...]; fol. 224: 'having been taken into custody by Mr. WILLEM VAN DER LELY'). Delft city archive, NA Delft, inv. 2792D (notary JORIS GEESTERANUS).

<sup>2</sup> The executors of L's estate were the Delft notary WILLEM VAN DER LELY and his brother-in-law GERARD VAN ASSENDELFT. They left no trace of these documents. VAN DER LELY's library was

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According to the custom of the time, the titles of L's publications were very long. Printed separately, the title pages served as advertisements for the books. They were hung on walls and distributed at book fairs. In the following list, the titles are shortened.

Year	Title	Letters	Publisher	D/ S <sup>3</sup>
	<i>Ondervindingen en Beschouwingen</i> Experiences and contemplations			
1684	<i>Onsigtbare Geschapene Waarheden</i> , Invisible created truths	32, 33 <sup>4</sup>	GAESBEECK	1
	<i>Eyerstok</i> , Ovary	37, 39 <sup>5</sup>	GAESBEECK	2
	<i>Schobbens in de Mond</i> , Scales in the mouth	40	GAESBEECK	3
	<i>Humor Cristallinus</i> , Crytalline humor	41	GAESBEECK	4
	<i>Ontleding en Ontdekkingen</i> Dissections and discoveries			
1685	<i>Onsigtbare Verborgentheden</i> , Invisible mysteries	38, 42, 43	BOUTESTEYN	5
	<i>Sout-figures</i> , Salt figures	46, 47	BOUTESTEYN	6
	<i>Zaden van Boomen</i> , Seeds of trees	44, 45	BOUTESTEYN	7
	<i>Anatomia et Contemplatio</i> , Anatomy and contemplation	43, 42, 38	BOUTESTEYN	21
1686	<i>Levende Dierkens</i> , Living animals	28-31, 34-36	BOUTESTEYN	8
	<i>Cinnaber Naturalis</i> , Natural cinnabar	48-52	BOUTESTEYN	9
1687	<i>Vervolg der Brieven</i> , Continuation of the letters	53-60	BOUTESTEYN	10
	<i>Anatomia Seu Interiora Rerum</i> , Anatomy or the interior of things	43, 42, 38	BOUTESTEYN	22
	<i>Anatomia Seu Interiora Rerum</i> , Anatomy or the interior of things	19 from 28-52 <sup>6</sup>	BOUTESTEYN	23
1688	<i>Vervolg der Brieven</i> , Continuation of the letters, 2 <sup>nd</sup>	53-60	BOUTESTEYN	10a
	<i>Den Waaragtigen Omloop des Bloeds</i> , On the true circulation of blood	65	VOORSTAD	11
1689	<i>Tweede Vervolg der Brieven</i> , Second Continuation of the letters	61-67	VOORSTAD	12

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auctioned in Amsterdam in 1775, but in the catalogue no Leeuwenhoek papers are mentioned. See NAGTEGAAL, 'Een vriendschap onder druk. Willem van der Lely, Hartman de Custer en de nalatenschap van Maria en Antoni van Leeuwenhoek'

<sup>3</sup> Dobell / Schierbeek number, see below.

<sup>4</sup> Some bundles also 39.

<sup>5</sup> Some bundles only 37.

<sup>6</sup> Letters 43, 42, 38, 28, 29, 30, 31, 34, 35, 36, 46, 47, 44, 45, 48, 49, 50, 51, 52, in that order.

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Year	Title	Letters	Publisher	D/ S <sup>3</sup>
	<i>Continuatio Epistolarum</i> , Continuation of the letters	53-60	BOUTESTEIN	24
1691	<i>Onsigbare Verborgentheden</i> , Invisible mysteries, 2 <sup>nd</sup>	38, 42, 43	BOUTESTEYN	5a
1693	<i>Derde Vervolg der Brieven</i> , Third continuation of the letters	68-75	KROONEVELT	13
1694	<i>Onsigbare Geschapene Waarbeden</i> , Invisible created truths	32, 39, 33	KROONEVELT	1a
	<i>Vierde Vervolg der Brieven</i> , Fourth continuation of the letters	76-83	KROONEVELT	14
1695	<i>Arcana Naturae Detecta</i> , The secrets of nature revealed	32, 33, 37, 39-41, 61-92	KROONEVELT	25
	<i>Register van alle de Werken</i> , Index of all the works, 2 parts	28-83	BOUTESTEYN	
1696	<i>Antoni van Leeuwenboeks 37<sup>ste</sup> Missive</i> , 37 <sup>th</sup> missive	37	BOUTESTEYN	2a
	<i>Antoni van Leeuwenboeks 40<sup>ste</sup> Missive</i> , 40 <sup>th</sup> missive	40	BOUTESTEYN	3a
	<i>Sout-figuren</i> , Salt figures, 2 <sup>nd</sup>	44, 45	BOUTESTEIN	6a
	<i>Levende Dierkens</i> , Living animals, 2 <sup>nd</sup>	28-31, 34-36	BOUTESTEIN	8a
	<i>Vijfde Vervolg der Brieven</i> , Fifth continuation of the letters	84-96	KROONEVELT	15
	<i>Continuatio Epistolarum</i> , Continuation of the letters, 2 <sup>nd</sup>	53-60	BOUTESTEIN	24a
	<i>Arcana Naturae Microscopiorum</i> , <sup>7</sup> Nature's microscopical secrets, 2 <sup>nd</sup>	19 van / from 28-52 <sup>3</sup>	BOUTESTEYN	25a
1697	<i>Zaden van Boomen</i> , Seeds of trees, 2 <sup>nd</sup>	46, 47	BOUTESTEYN	7a
	<i>Tweede Vervolg der Brieven</i> , Second continuation of the letters, 2 <sup>nd</sup>	61-67	KROONEVELT	12a
	<i>Sesde Vervolg der Brieven</i> , Sixth continuation of the letters	97-107	KROONEVELT	16
	<i>Continuatio Arcanorum Naturae</i> , Continuation of nature's secrets	93-107	KROONEVELT	26
1698	<i>Onsigbare Verborgentheden</i> , Invisible mysteries, 3 <sup>rd</sup>	38, 42, 43	BOUTESTEYN	5b
	<i>A. van Leeuwenboeks 41<sup>ste</sup> Missive</i> , 41 <sup>st</sup> missive	41	KROONEVELT	17
1702	<i>Sevende Vervolg der Brieven</i> , Seventh Continuation of the letters	108-146	KROONEVELD	18
1704	<i>Vervolg der Brieven</i> , Continuation of the letters, 3 <sup>rd</sup>	53-60	BOUTESTEYN	10b

<sup>7</sup> In DOBELL, *Antony van Leeuwenhoek and his "Little Animals"*, p. 395, this volume is listed as 25a. *Arcana Naturae Detecta*, 2<sup>e</sup>, ("The secrets of nature revealed, 2<sup>nd</sup>).



Year	Title	Letters	Publisher	D/ S <sup>3</sup>
1708	<i>Arcana Naturae Microscopiorum</i> , <sup>8</sup> Nature's microscopical secrets, 3 <sup>rd</sup>	19 from 28-52	BOUTESTEIN	25b
1713	<i>Cinnaber Naturalis</i> , Natural cinnabar, 2 <sup>nd</sup>	48-52	LANGERACK	9a
1715	<i>Continuatio Epistolarum</i> , Continuation of the letters, 3 <sup>rd</sup>	53-60	LANGERAK	24b
1718	<i>Send-Brieven</i> , Epistles	I-XLVI	BEMAN	19
1719	<i>Epistolae ad Societatem</i> , Letters to the Society	108-146	LANGERAK	27
	<i>Epistolae Physiologicae</i> , Physiological letters	I-XLVI	BEMAN	28
1722	<i>Anatomia Seu Interiora Rerum, Editio novissima</i> , Anatomy or the interior of things, the latest edition	19 from 28-52	LANGERAK	23a
	<i>Arcana Naturae Detecta, Editio novissima, auctior et correctior</i> , Nature's mysteries disclosed, The latest edition, larger and more correct	32, 33, 37, 39-41, 61-92	LANGERAK	25c
	<i>Continuatio Arcanorum Naturae Detectorum</i> , Continuation of nature's mysteries disclosed, 2 <sup>nd</sup>	93-107	LANGERAK	26a
1730	<i>Continuatio Epistolarum</i> , Continuation of the letters, 4 <sup>th</sup>	53-60	LANGERAK	24c

### Dobell number 20 ('Works') and number 29 ('Opera Omnia')

During L.'s life no 'Collected Works' were published, in Dutch or Latin, in the sense that a set of volumes was uniformly edited, typeset, printed, bound, and published simultaneously by a single publisher. The works that were published at the time, either by a publisher or commissioned by LEEUWENHOEK himself, are therefore often different in composition. For libraries and collectors, as long as a set has all 165 letters, in either Dutch or Latin, it may be regarded as being complete. In his famous biography CLIFFORD DOBELL made a bibliography, the numbers we, too, use in the list below.<sup>9</sup> SCHIERBEEK also used the Dobell numbers in his bibliography.<sup>10</sup>

<sup>8</sup> In DOBELL, p. 395, this volume is listed as 25b. *Arcana Naturae Detecta*, 3<sup>c</sup>.

<sup>9</sup> DOBELL, "A short list of Leeuwenhoek's writing", in: *Antony van Leeuwenhoek and his "Little Animals"*, pp. 388-397.

<sup>10</sup> SCHIERBEEK, 'Bijlage 2: Uitgaven', in: *Antoni van Leeuwenhoek: Zijn Leven en Werken*, vol. 2 (1950), pp. 495-499. The numbering in DOBELL's bibliography, repeated uncritically by SCHIERBEEK, has become the standard even though DOBELL was describing only his set. He accounted for all of the published titles except the titles that he labelled second and third editions of *Arcana Naturae* but were, in fact, re-titled editions of a different set of letters. In addition, the 'Short-Title Catalogue Netherlands' (STCN) web lists an additional title, a 1696 second edition of *Ontdeckte Onsigbaar-beeden*, published by BOUTESTEYN alone. What DOBELL did not have were the various bundles of the letters, the different combinations in which they were bound. Google Books, for example, has bundles that are not listed in DOBELL, SCHIERBEEK, or the STCN. Also,

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The difference between a four-volume set and a five- or six-volume set seems to be in the middle volumes. If Dobell number14 is bound in volume 2, then number18 fits into volume 3 and number19 *Send-Brieven* is volume 4. The National Library of Medicine also lists a 6-volume set that has the middle volumes in pairs: Dobell number10 and number12 in volume 2, Dobell number13 and number14 in volume 3, and Dobell number15 and number16 in volume 4, pushing Dobell number18 and number19 to volumes 5 and 6. In Dobell's bibliography, he lists the *Werken* as number 20, which is not on the table above:

“20. Brieven [seu Werken]. 4°. 4 vols, (or sometimes 5). Various dates, publishers, and places. — The final Dutch collective edition of all L.'s published letters. Contains Letters 28-146 and I-XLVI, and is variously made up of the several separate issues already listed—bound together”.

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In other words, *Werken* and *Opera Omnia* are more accurately thought of as bindings or bundles or collections than as separate publications. The table below shows a common four-volume distribution.

### Dobell number 20 ('Works') Dutch editions

Year	Dobell number (#)	letter #	AvL #
Short title, printer			
1684-1686	<b>Deel I:</b> <i>Ontdeckte Onsigtbaar-heeden</i> . Dobell 1-4, Gaesbeeck 1684; 5-9, Boutesteyn, 1685. Bundles sometimes include 10 <i>Vervolg der Brieven</i> with Letters 53-60.	25	28-52
1696	<i>Ontdeckte Onsigtbaar-heeden</i> . 2 <sup>e</sup> , 2 <sup>nd</sup> , Dobell 1-9, Boutesteyn. Only in STCN.	25	28-52
1687-1694	<b>Deel II:</b> 10. <i>Vervolg der Brieven</i> , Boutesteyn 1687, 12. <i>Tweede vervolg</i> , Voorstad 1689, 13. <i>Derde Vervolg</i> , Kroonevelt 1693, 14. <i>Vierde Vervolg</i> , Kroonevelt 1694 and sometimes 15. <i>Vijfde Vervolg</i> .	31	53-83
1696, 1697, 1702	<b>Deel III:</b> 15. <i>Vijfde vervolg</i> , 16. <i>Sesde vervolg</i> , 18. <i>Sevende vervolg</i> , Kroonevelt.	63	84-146
1718	<b>Deel IV:</b> 19. <i>Send-Brieven</i> , Beman.	46	I-XLVI

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antiquarian catalogues available online show bundles that are in none of these resources. See also ANDERSON, website 'Lens on Leeuwenhoek', lemma 'Publications'

<sup>11</sup> DOBELL, p. 394.

**Dobell Number 29**  
***Opera Omnia / The Works***  
**Latin editions**

Year	Dobell # Korte title, drukker	letter #	AvL #
	Short title, printer		
1715	<b>Deel I:</b> 24. <i>Continuatio Epistolarum</i> , 3 <sup>e</sup> , 3 <sup>rd</sup> , Langerak.	8	53-60
1722	23a. <i>Anatomia Seu Interiora Rerum, Editio novissima</i> , newest edition, retranslated, Langerak.	19	28-31, 34-36, 38, 42-52
	<b>Deel II:</b> 25c. <i>Arcana Naturae Detecta, Editio novissima</i> newest edition, retranslated, Langerak.	38	32, 33, 37, 39, 40, 41, 61-92
	26a. <i>Continuatio Arcanorum Naturae detectorum</i> , 2 <sup>e</sup> , 2 <sup>nd</sup> , Langerak	15	93-107
1719	<b>Deel III:</b> 27. <i>Epistolae ad Societatem</i> , Langerak.	39	108-146
	<b>Deel IV:</b> 28. <i>Epistolae Physiologicae</i> , Beman.	46	I-XLVI

## Publishers

### *Leiden*

DANIEL VAN GAESBEECK: 1684  
 CORNELIS BOUTESTEYN, also BOUTESTEIN: 1685-1708  
 JOHAN ARNOLD LANGERAK, also LANGERACK: 1713-1730

### *Delft*

ANDRIES VOORSTAD: 1688- 1689  
 HENDRIK KROONEVELT, also KROONEVELD: 1694-1702  
 ADRIAAN BEMAN: 1718-1719

## APPENDICES

### Appendix 16. Visitors to L's house, the 'Gulden Hoofd' (1674-1723)

This list includes all of the 99 named people for whom a visit to L.'s home, *Het Gulden Hoofd* (the golden head), can be verified in primary sources. Of them, only 20 were also correspondents (Appendix 17), suggesting some lost letters of introduction and courtesy thank-you letters.

In many letters, L. recalled a conversation with someone, sometimes by name, but unless it is clear that the conversation occurred at *Het Gulden Hoofd*, it is not included here. Other people not on this list were such good friends that they must have visited L., for example, Delft physician and L.'s mentor REINIER DE GRAAF, L.'s attorney PAUL DURVEN, or his friends MARIA DUYST VAN VOORHOUT and her husband FREDERIK ADRIAAN VAN REEDE. Some of the visitors, such as CONSTANTIJN HUYGENS Sr., CORNELIS BONTEKOE, L.'s mentor CORNELIS 'S GRAVESANDE, L.'s friend from Zeeland ANGELUS VAN WIKHUYSEN, and Leiden professor HERMAN BOERHAAVE, would have visited far more often than the visits documented below. However, there is no direct evidence in the primary sources of such visits.

#### Named visitors – in alphabetical order (marked with an asterisk if they also corresponded with L.)

ACQUET, Hendrik d' – some years before 1696	CHILD, Sir Francis – summer 1697
ADAMS, Archibald – before mid-August 1709	CLUVER, Detlev – May 1688
ANDERSON, Johann – April 1697	COLSON, Mr. – early June 1686
BARTHOLIN, Christopher – 11 August 1674	COMPTON, Henry – May 1679
BARTHOLIN, Caspar – 11 August 1674	CORDES, Henry – May-August 1677
BARTHOLIN, Rasmus – 11 August 1674	CORNARO, Francisco – fall 1705*
BARTHOLIN, Thomas – 11 August 1674	CRAANEN, Theodore – 1677 to around 1688*
BEUSECOM, Abraham van – August 1698	CROZE, Jean de la – before May 1693
BIDLOO, Govert – 7 March 1706*	DRELINCOURT, Charles – before March 1685
BLAEU, Willem – Summer 1691	FARRINGTON, John – 27 November 1710
BLEYSWIJK, Abraham van – November 1714; early November 1716; before 1718*	FLORIAN, Anton – spring 1704
BOCCONE, Paolo – 31 May 1674	GORDON, Robbert – May-August 1677
BOERHAAVE, Herman – September 1716*	GRAVESANDE, Cornelis 's – end of December 1684, before September 1688
BONTEKOE, Cornelis – around 1682	GREGORY, David – between 1688 and 1695
BOOGERT, Johannes – May-August 1677	GRONOVIVS, Jacob – 5 November 1686; early 1698*
BRADLEY, Richard – 9 May 1714	HAAN, Benedict – May-August 1677*
BRAND, Hennig – 11 September 1677	HAM, Johan – 1677 to around 1688
BRAUNSCHWEIG-WOLFENBÜTTEL, Anton Ulrich von – 1691 or 1709	HARTSOEKER, Christiaan – after October 1675
BROUNOWER, Sylvester – 22 June 1685	HARTSOEKER, Nicolaas – after October 1675; end of 1679; and 1697 or 1698
BURCH, W. van der – May-August 1677	HARWOOD, John – mid-September 1697*
BURNET, Thomas – 7 July 1707	HEINSIUS, Anthonie – before September 1688*
BURNET, William – 7 July 1707	HESSEN-DARMSTADT, Elisabeth von – 28 June 1695
BURNET jr., Gilbert – 7 July 1707	
BURNET sr., Gilbert – 7 July 1707	
CHAMBERLAYNE's nephew, John – 29 April 1707	

## APPENDICES

HESSEN-KASSEL, Friedrich von – before 1702	PFALZ-NEUBURG, Johann W. von – 28 June 1695*
HESSEN-KASSEL, Karl von – October 1685*	POITEVIN, Robert – May-August 1677
HESSEN-PHILIPPSTAL, Philipp von – before 1702	RABUS, Pieter, – August 1693 and later*
HODENPIJL, Aldert – May-August 1677	RAPER, Matthew – mid-July 1723
HOOGVLIET, Johannes – May to August 1723	REINERDING, Joachim Georg – July 1715, October 1716
HOTTON, Peter – before September 1704*	RETTWICH, Georg Henrik van – early 1697
HUTTON, John – summer 1692	RICASOLI, Bettino – October 1695
HUYDECOPER, Joan – 1680	ROMANOV, Peter, Tsar of Russia – mid-October 1697
HUYGENS, Christiaan – fall 1688 and later*	RUYSCH, Frederik – September 1716
HUYGENS, Constantijn – before June 1679*	SAINGERMAIN, De – late December 1685
JACOBÆUS, Holger – 11 August 1674	SEYN, Arent – 11 August 1674
KRAFT, Johann Daniel – early 1691	SONNEMANS, Mattheus – a few years before 1711
LEIBNIZ, Gottfried – 18 November 1676*	STUART, Alexander – before 4 January 1710
LOCKE, John – 22 June 1685	STUART, duke of York, James – May 1679*
LOON, Gerard van – 1716*	SWAMMERDAM, Johannes – summer 1674; 1675
MANCINI, Marie-Anne – before 16 September 1683	UFFENBACH, Johann F. von – 4 December 1710
MEDICI, Anna Maria Ludovica de – 28 June 1695	UFFENBACH, Zacharias C. von – 4 December 1710
MEESTER, Willem – October 1685	VALCKENIER, Peter – late November or early December 1704, March 1705*
MESMES, Jean-Antoine de – before 16 September 1683	VALLENSIS, Cornelis – before September 1688
MOLYNEAUX, William – summer 1685	VELDEN, Maarten Etienne van – 1695*
MOLYNEUX, Thomas – early February 1685	VERBRUGGE, Alewijn – November 1722
MORISON, Robert – mid-May 1683	VERNON, James – before 28 April 1702
ORTT, Johan – summer 1674, 1675	WALFORT, Mr. – May 1694
OVERSCHIE, Frederik Wolfert van – summer 1695; 1696; 1697; 4 August 1697	WIKHUYSEN, Angelus van – Summers in the 1690s and 1700s*
PALFIJN, Jan – before 1718	WITTELSBACH, Maximilian II Emmanuel of – May 1679
PAPENBROEK, Daniel – 28 October 1695*	
PAUW, Franco – 28 April 1702	
PETRIE, Alexander – May-August 1677	

## APPENDICES

### Known first visits – in chronological order (See list above for exact dates)

**1674**  
BARTHOLIN, Caspar  
BARTHOLIN, Christopher  
BARTHOLIN, Rasmus  
BARTHOLIN, Thomas  
BOCCONE, Paolo  
JACOBÆUS, Holger  
ORTT, Johan  
SEYN, Arent  
SWAMMERDAM, Johannes

**1675**  
HARTSOEKER, Christiaan  
HARTSOEKER, Nicolaas

**1676**  
LEIBNIZ, Gottfried

**1677**  
BOOGERT, Johannes  
BRAND, Hennig  
BURCH, W. van der  
CORDES, Henry  
GORDON, Robbert  
HAAN, Benedict  
HAM, Johan  
HODENPIJL, Aldert  
PETRIE, Alexander  
POITEVIN, Robert

**1679**  
COMPTON, Henry  
HUYGENS, Constantijn  
STUART, duke of York, James  
WITTELSBACH, Maximilian II E.

**1680**  
HUYDECOPER, Joan

**1682**  
BONTEKOE, Cornelis

**1683**  
MANCINI, Marie-Anne  
MESMES, Jean-Antoine de  
MORISON, Robert

**1684**  
GRAVESANDE, Cornelis 's

**1685**  
BROUNOWER, Sylvester  
DRELCINCOURT, Charles  
HESSEN-KASSEL, Karl von  
LOCKE, John  
MEESTER, Willem  
MOLYNEAUX, William  
MOLYNEUX, Thomas  
SAINGERMAIN, De

**1686**  
COLSON, Mr.  
GRONOVIVS, Jacob

**1688**  
CLUVER, Detlev  
GRAVESANDE, Cornelis 's  
HEINSIUS, Anthonie  
HUYGENS, Christiaan  
VALLENSIS, Cornelis

**ca. 1690**  
WIKHUYSEN, Angelus van

**1691**  
BLAEU, Willem  
BRAUNSCHWEIG-WOLFENBÜTTEL,  
Anton Ulrich von (?)  
KRAFT, Johann Daniel

**1692**  
HUTTON, John

**1693**  
CROZE, Jean de la  
RABUS, Pieter

**1694**  
WALFORT, Mr.

**1695**  
HESSEN-DARMSTADT, Elisabeth von  
MEDICI, Anna Maria Ludovica de  
OVERSCHIE, Frederik Wolfert van  
PAPENBROEK, Daniel  
PFALZ-NEUBURG, Johann W. von  
RICASOLI, Bettino  
VELDEN, Maarten Etienne van

**1696**

OVERSCHIE, Frederik Wolfert van

**1697**

ANDERSON, Johann

CHILD, Sir Francis

HARWOOD, John

RETTWICH, Georg Henrik van

ROMANOV, Peter, Tsar of Russia

**1698**

BEUSECOM, Abraham van

**1702**

HESSEN-KASSEL, Friedrich von

PAUW, Franco

VERNON, James

**1704**

FLORIAN, Anton

HOTTON, Peter

VALCKENIER, Peter

**1705**

CORNARO, Francisco

**1706**

BIDLOO, Govert

**1707**

BURNET jr., Gilbert

BURNET sr., Gilbert

BURNET, Thomas

BURNET, William

CHAMBERLAYNE'S nephew, John

**1709**

ADAMS, Archibald

**1710**

FARRINGTON, John

STUART, Alexander

UFFENBACH, Johann F. von

UFFENBACH, Zacharias C. von

**1711**

Sonnemans, Mattheus

**1714**

BLEYSWIJK, Abraham van

BRADLEY, Richard

**1715**

Reinerding, Joachim Georg

**1716**

BOERHAAVE, Herman

RUYSCH, Frederik

**1718**

PALFIJN, Jan

**1722**

VERBRUGGE, Alewijn

**1723**

HOOGVLIET, Johannes

RAPER, Matthew

## APPENDICES

### Unnamed visitors – chronological

1675, autumn	– Gentlemen amateurs
1676, before April	– Curious persons
1677, before March	– A gentleman
11 September	– Some German gentlemen
1679, May	– Several high personages
1681, before November	– A gentleman
1685, before 12 October	– A ship's captain
1686, January	– A commander and foreign princes
1687, before August	– Several prominent Dutch gentlemen
around October	– A Prussian doctor
1691, fall	– Illustrious persons and learned gentlemen
1692, summer	– Other learned gentlemen
1694, November	– A very learned and distinguished gentleman
1695, many years before	– A foreign gentleman
before May	– A gentleman
May	– An illustrious person
28 June	– Two court physicians
4 August	– Five distinguished gentlemen
1696, April	– Two gentlemen
July	– Friends who came to visit
September	– A gentleman
1697, some years before	– An elderly theologian
early	– An aged doctor
summer	– Various gentlemen, various English gentlemen
1698, spring	– Excellent men
spring	– A gentleman
1699	– A distinguished person, a doctor of medicine, a great mathematician
before June	– Eminent scholars and observant persons
early June	– A board of distinguished Dutch gentlemen
10 June	– Two gentlemen from Leipzig
1700, around	– Ambassador of a crowned head
December	– A member of the Royal Society
1700-1701, winter	– A glass grinder
1701, 6 January	– A very learned gentleman
7 April	– A Delft brewer
before August	– A gentleman and friend, some gentlemen, a certain gentleman
August	– A gentleman
1704, spring	– Two distinguished gentlemen
before 4 November	– Interested gentleman
1705, end of February	– A local farmer
1709, late summer	– Three most distinguished gentlemen at the court of His Majesty
1710, before 4 January	– Two Scotch gentlemen
early January	– Twenty-six people, including a duke and an earl
1711, a few years before	– Another gentleman
1715	– A ship's mate
1716, some years before	– Some gentlemen of the Dutch high government
November	– A great theologian and doctor of medicine
1717, before March	– A well-versed scientist
before July	– Medical doctors
summer	– Two very famous professors
1720s, early	– A gentleman and a tenant farmer
1723, May to August	– Two doctors of medicine



## Appendix 17. Leeuwenhoek's Correspondents

### A. 72 named correspondents (20 of whom were also visitors – listed with an \*)

Johan Arnoldi	Jan Gerard Kerkherdere	Richard Waller
Adriaen van Assendelft	Jan van Leeuwen	Angelus van
Francis Aston	Gottfried Wilhelm	Wikhuysen*
Victor van Beughem	Leibniz*	Joseph Williamson
Govert Bidloo*	Gerard van Loon	Nicolaas Witsen
Hendrik van Bleyswijk	Antonio Magliabechi	Christopher Wren
Abraham van	Mary, Queen of	Harmen van Zoelen
Bleyswyck*	England, Scotland	
Ewout van Bleyswyck	and Ireland	
Herman Boerhaave*	Jan Meerman	
Nicolaas Bogaert	Isaac Newton	
Robert Boyle	Ursmer Narez	
William Brouncker	Henry Oldenburg	
Jacob Calckberner	Daniël van	
Siewert Centen	Papenbroek*	
John Chamberlayne	James Petiver	
Charles VI	Johann Wilhelm von	
Antony Cink	Pfalz-Neuburg*	
Francesco Cornaro*	Hubert Kornelis Poot	
Theodoor Craanen*	Pieter Rabus*	
Daniel van Gaesbeek	Frederik Adriaan van	
Thomas Gale	Reede van	
George Garden	Renswoude	
Luca Giamberti	Hendrik Jozef Rega	
David Gregory	Pieter vander Slaart	
Nehemiah Grew	Hans Sloane	
Jacob Gronovius*	John Somers	
Benedictus Haan*	Cornelis Spiering	
Edmond Halley	William Stanley	
John Harwood*	Adriaan Swalmius	
Anthonie Heinsius*	Melchisedec Thévenot	
Karl von Hessen-	Ehrenfried W. von	
Kassel*	Tschirnhaus	
Robert Hooke	Petrus Valckenier*	
Pieter Hotton*	Maarten Etienne van	
Christiaan Huygens*	Velden*	
Constantijn Huygens*	Lambert van	
James, duke of York*	Velthuysen	
James Jurin	Fortunato Vinaccesi	

## APPENDICES

### **B. Eleven general or anonymous correspondents**

A doctor from Prussia  
A gentleman in Brabant  
His Excellency Mr. ...  
Members of the Royal Society  
Two noblemen  
An unknown Sir  
Some directors of the United East India Company in Delft  
A Highly Learned Sir  
Some mayors and governors of Delft  
A Right Honourable Sir  
Your Most Serene Highness

### **C. Six persons who did not correspond directly to L.**

Arnout van den Berch  
Abraham Edens  
Peter Gribius  
Johannes Hoogvliet  
Maria van Leeuwenhoek  
Thomas Molynaux

### **D. Three persons who wrote relevant documents**

Martin Folkes, Royal Society vice-president  
Joris Geesteranus, notary  
Jacob van den Werf, notary

## Geographical distribution of the correspondents

London	Delft	Dutch Republic	Other Europe countries
Francis Aston	Adriaen van	Victor van	Johan Arnoldi
Robert Boyle	Assendelft	Beughem	Jacob Calckberner
William Brouncker	Hendrik van	Govert Bidloo	Antony Cink
John Chamberlayne	Bleiswijk	Herman Boerhaave	Charles VI
Thomas Gale	Abraham van	Siewert Centen	Francesco Cornaro
George Garden	Bleiswyck	Theodoor Craanen	Luca Giamberti
David Gregory	Ewout van	Daniel van	Karl von Hessen-
Nehemiah Grew	Bleiswyck	Gaasbeek	Kassel
Edmond Halley	Nicolaas Bogaert	Jacob Gronovius	Jan Gerard
John Harwood	Gerard van Loon	Benedictus Haan	Kerkherdere
Robert Hooke	Jan Meerman	Anthonie Heinsius	Gottfried Wilhelm
Pieter Hotton	Cornelis Spiering	Christiaan Huygens	Leibniz
James, duke of York	Adriaan Swalmius	Constantijn Huygens	Antonio Magliabechi
James Jurin	N.N. directors of the United East	Jan van Leeuwen	Ursmer Narez
Mary, Queen of England, Scotland and Ireland	India Company in Delft	Hubert Kornelis Poot	Daniël van Papenbroek
Isaac Newton	N.N. mayors and governors of Delft	Pieter Rabus	Johann Wilhelm
Henry Oldenburg		Frederik Adriaan van Reede van	von Pfalz- Neuburg
James Petiver		Renswoude	Hendrik Jozef Rega
Hans Sloane		Pieter vander Slaart	Melchisedec
John Somers		Petrus Valckenier	Thévenot
William Stanley		Maarten Etienne	Ehrenfried W. von
Richard Waller		van Velden	Tschirnhaus
Joseph Williamson		Lambert van	Fortunato Vinaccesi
Christopher Wren		Velthuysen	doctor from Prussia
		Angelus van	
		Wikhuysen	
		Nicolaas Witsen	
		Harmen van	
		Zoelen	
		gentleman in	
		Brabant	

## APPENDICES

### Appendix 18. All of the letters to and from Van Leeuwenhoek (1673-1724)

The surviving letters to and from Leeuwenhoek have been numbered three times. During his lifetime, Leeuwenhoek numbered 192 letters, including the first 27, which he did not publish on his own, plus the 165 letters that he did publish, beginning with number 28 and ending with number 146 and, after a pause of ten years, another 46 letters, number I through number XLVI.

In the 1930s, the *Collected Letters* project began as a collection of only letters written by Leeuwenhoek, creating a new numbering system that included all of the letters, not just those that he had numbered. In this dual numbering system, a letter was known by the *Collected Letters* number followed by Leeuwenhoek's number, where applicable, in brackets. For example, the first letter that Leeuwenhoek published was Letter 43 [28] of 25 April 1679 to Nehemiah Grew.

From the start, in volume 1, *Collected Letters* included lost letters known only by reference in other letters but given a place in the numbering system. For example, Letter 3 of 8 November 1673 to Henry Oldenburg is known only by reference in the Letter 5 of 7 April 1674.

Beginning in volume 8, letters to Leeuwenhoek from others began appearing, but without a number. Volume 9, for example, has fourteen numbered letters from Leeuwenhoek and five unnumbered letters to him. These letters to Leeuwenhoek were not given a number until volume 17, which included four letters to Leeuwenhoek from Anthonie Heinsius and Gottfried Leibniz. Beginning with volume 18, the original *Collected Letters* numbering system was abandoned.

The editors of the final volumes decided to expand volume 19 with some relevant letters and documents between others about Leeuwenhoek and to add an additional volume 20. It has almost two hundred letters, all of the letters from and to Leeuwenhoek missed in previous volumes, many of them without specific dates and many of them known only by reference in other letters and sources. The earlier inconsistencies and the final catch-up volume created a need for a uniform numbering system, which was applied beginning with volume 18. Each letter now has only one L-number, L-000 through L-601.

For an alphabetical list of the correspondents as well as their geographical distribution, see Appendix 17.

## APPENDICES

L-#	AvL #	AdB/ CL #	AdB/ CL vol			
L-000			20	28 April 1673	from	Reinier de Graaf to Henry Oldenburg
L-001	1	1	1	28 April 1673	to	Henry Oldenburg
L-002	2	2	1	15 August 1673	to	Henry Oldenburg
L-003		3	1	8 November 1673	to	Henry Oldenburg
L-004			20	February 1674	from	Constantijn Huygens
L-005		4	1	5 April 1674	to	Constantijn Huygens
L-006	3	5	1	7 April 1674	to	Henry Oldenburg
L-007			20	11 April 1674	from	Constantijn Huygens
L-008		6	1	16 April 1674	to	Henry Oldenburg
L-009		7	1	24 April 1674	to	Constantijn Huygens
L-010			20	4 May 1674	from	Henry Oldenburg
L-011	4	8	1	1 June 1674	to	Henry Oldenburg
L-012	5	9	1	6 July 1674	to	Henry Oldenburg
L-013			20	30 August 1674	from	Henry Oldenburg
L-014		10	1	7 September 1674	to	Henry Oldenburg
L-015	6	11	1	7 September 1674	to	Henry Oldenburg
L-016	7	12	1	19 October 1674	to	Henry Oldenburg
L-017			20	5 November 1674	from	Henry Oldenburg
L-018	8	13	1	4 December 1674	to	Henry Oldenburg
L-019		14	1	26 December 1674	to	Constantijn Huygens
L-020			20	3 January 1675	from	Henry Oldenburg
L-021	9	15	1	22 January 1675	to	Henry Oldenburg
L-022	10	16	1	11 February 1675	to	Henry Oldenburg
L-023			20	1 March 1675	from	Henry Oldenburg
L-024	11	17	1	26 March 1675	to	Henry Oldenburg
L-025			20	22 April 1675	from	Henry Oldenburg
L-026	12	18	1	14 August 1675	to	Henry Oldenburg
L-027			20	22 August 1675	from	Henry Oldenburg
L-028	13	19	1	20 December 1675	to	Henry Oldenburg
L-029			20	1676	to	Theodore Craanen
L-030			20	7 January 1676	from	Henry Oldenburg

## APPENDICES

L-#	AvL #	AdB/ CL #	AdB/ CL vol			
L-031		20	1	22 January 1676	to	Henry Oldenburg
L-032			20	13 February 1676	from	Henry Oldenburg
L-033			20	20 February 1676	from	Henry Oldenburg
L-034	14	21	1	22 February 1676	to	Henry Oldenburg
L-035	15	22	2	21 April 1676	to	Henry Oldenburg
L-036			20	14 May 1676	from	Henry Oldenburg
L-037	16	23	2	29 May 1676	to	Henry Oldenburg
L-038		24	2	28 July 1676	to	Henry Oldenburg
L-039	17	25	2	28 July 1676	to	Robert Boyle
L-040	18	26	2	9 October 1676	to	Henry Oldenburg
L-041			20	18 October 1676	from	Henry Oldenburg
L-042			20	26 October 1676	from	Henry Oldenburg
L-043		27	2	30 October 1676	to	Henry Oldenburg
L-044			20	31 October 676	from	Constantijn Huygens
L-045		28	2	7 November 1676	to	Constantijn Huygens
L-046			20	12 November 1676	from	Henry Oldenburg
L-047		29	2	27 November 1676	to	Henry Oldenburg
L-048			20	1677	from	Theodore Craanen
L-049			20	1677	to	Robert Boyle
L-050			20	9 February 1677	from	Christiaan Huygens
L-051		30	2	15 February 1677	to	Christiaan Huygens
L-052			20	22 February 1677	from	Henry Oldenburg
L-053			20	4 March 1677	from	Henry Oldenburg
L-054	19	31	2	23 March 1677	to	Henry Oldenburg
L-055			20	20 April 1677	from	Henry Oldenburg
L-056	20	32	2	14 May 1677	to	Henry Oldenburg
L-057			20	7 August 1677	from	Henry Oldenburg
L-058	21	33	2	5 October 1677	to	Henry Oldenburg
L-059		34	2	16 October 1677	to	William Brouncker
L-060	22	35	2 / 20	November 1677	to	William Brouncker
L-061		36	2	2 or 3 December 1677	to	William Brouncker

## APPENDICES

L-#	AvL #	AdB/ CL #	AdB/ CL vol			
L-062		no #	12	8 December 1677	to	Constantijn Huygens in letter L-349 [196] from 17 December 1698 to Zoelen
L-063			20	10 December 1677	from	Robert Hooke
L-064			20	1678	to	Robert Boyle
L-065			20	11 January 1678	from	Robert Hooke, Nehemiah Grew
L-066			20	11 January 1678	from	Nehemiah Grew
L-067	23	37	2	14 January 1678	to	Robert Hooke
L-068			20	11 February 1678	from	Robert Hooke
L-069			20	14 February 1678	to	Joseph Williamson
L-070	24	38	2	18 March 1678	to	Nehemiah Grew
L-071			20	20 April 1678	from	Nehemiah Grew
L-072			20	28 April 1678	from	Robert Hooke
L-073	25	39	2	31 May 1678	to	Nehemiah Grew
L-074	26	40	2	27 September 1678	to	Nehemiah Grew
L-075			20	13 October 1678	from	Nehemiah Grew
L-076			20	23 December 1678	from	Constantijn Huygens
L-077		41	2	26 December 1678	to	Constantijn Huygens
L-078	27	42	2	21 February 1679	to	Nehemiah Grew
L-079			20	12 April 1679	from	Lambert van Velthuysen
L-080	28	43	3	25 April 1679	to	Nehemiah Grew
L-081		44	3	27 April 1679	to	Constantijn Huygens
L-082			20	4 May 1679	from	Constantijn Huygens
L-083		45	3 / 20	11 May 1679	to	Lambert van Velthuysen
L-084		46	3	15 May 1679	to	Christiaan Huygens
L-085		47	3	20 May 1679	to	Constantijn Huygens
L-086			20	early June 1679	from	Lambert van Velthuysen
L-087		48	3	13 June 1679	to	Nehemiah Grew
L-088		49	3	13 June 1679	to	Lambert van Velthuysen

## APPENDICES

L-#	AvL #	AdB/ CL #	AdB/ CL vol			
L-089			20	17 June 1679	from	Lambert van Velthuysen
L-090		50	3	11 July 1679	to	Lambert van Velthuysen
L-091			20	August 1679	from	Robert Hooke
L-092		51	3	13 October 1679	to	Robert Hooke
L-093			20	18 October 1679	from	Lambert van Velthuysen
L-094			20	27 October 1679	from	Robert Hooke
L-095		52	3	14 November 1679	to	Lambert van Velthuysen
L-096		53	3	20 November 1679	to	Robert Hooke
L-097	29	54	3	12 January 1680	to	Robert Hooke
L-098		55	3	16 January 1680	to	Robert Hooke
L-099			20	2 February 1680	from	Robert Hooke
L-100		56	3	13 February 1680	to	Robert Hooke
L-101			20	7 March 1680	from	Thomas Gale
L-102	30	57	3	5 April 1680	to	Robert Hooke
L-103			20	22 April 1680	from	Robert Hooke
L-104		58	3	13 May 1680	to	Members of the Royal Society
L-105		59	3	13 May 1680	to	Robert Hooke
L-106	31	60	3	13 May 1680	to	Thomas Gale
L-107		61	3	14 June 1680	to	Robert Hooke
L-108	32	62	3	14 June 1680	to	Thomas Gale
L-109		63	3	9 August 1680	to	Robert Hooke
L-110		64	3	28 September 1680	to	Thomas Gale
L-111	33	65	3	12 November 1680	to	Robert Hooke
L-112			20	4 July 1681	from	Robert Hooke
L-113			20	17 July 1681	from	David Gregory
L-114	34	66	3	4 November 1681	to	Robert Hooke
L-115			20	December 1681	from	Robert Hooke
L-116	35	67	3	3 March 1682	to	Robert Hooke
L-117			20	20 March 1682	from	Robert Hooke
L-118			20	26 March 1682	from	Robert Hooke



## APPENDICES

L-#	AvL #	AdB/ CL #	AdB/ CL vol			
L-119	36	68	3	4 April 1682	to	Robert Hooke
L-120		69	3	28 July 1682	to	Robert Hooke
L-121			20	1683	to	unknown Mijn Heer
L-122	37	70	4	22 January 1683	to	Christopher Wren
L-123			20	26 February 1683	from	Francis Aston
L-124			20	9 March 1683	to	Francis Aston
L-125			20	27 March 1683	from	Francis Aston
L-126		71	4	20 May 1683	to	Anthonie Heinsius
L-127			20	7 June 1683	from	Anthonie Heinsius
L-128	38	72	4	16 July 1683	to	Christopher Wren
L-129		73	4	22 July 1683	to	Anthonie Heinsius
L-130			20	27 August 1683	from	Francis Aston
L-131			20	August or September 1683	from	two noblemen
L-132		74	4	2 September 1683	to	Anthonie Heinsius
L-133			20	10 September 1683	from	Anthonie Heinsius
L-134		75	4	16 September 1683	to	Anthonie Heinsius
L-135	39	76	4	17 September 1683	to	Francis Aston
L-136		77	4	30 September 1683	to	Anthonie Heinsius
L-137			20	October 1683	to	Melchisedec Thevenot
L-138			20	October 1683	from	Melchisedec Thevenot
L-139			20	8 October 1683	from	Anthonie Heinsius
L-140			20	11 October 1683	from	Francis Aston
L-141		78	4	14 October 1683	to	Anthonie Heinsius
L-142			20	18 October 1683	from	Anthonie Heinsius
L-143			20	26 October 1683	to	Francis Aston
L-144	40	79	4	28 December 1683	to	Francis Aston
L-145			20	1 January 1684	from	Daniel van Gaesbeek
L-146			20	7 March 1684	from	Francis Aston
L-147	41	80	4	14 April 1684	to	Francis Aston
L-148			20	7 June 1684	from	Francis Aston
L-149			20	24 July 1684	from	Daniel van Gaesbeek

## APPENDICES

L-#	AvL #	AdB/ CL #	AdB/ CL vol			
L-150	42	81	4	25 July 1684	to	Members of the Royal Society
L-151			20	August- mid-October 1684	from	Francis Aston
L-152	43	82	5	5 January 1685	to	Members of the Royal Society
L-153			20	20 January 1685	from	Francis Aston
L-154	44	83	5	23 January 1685	to	Members of the Royal Society
L-155			20	13 February 1685	from	Thomas Molyneux to Francis Aston
L-156			20	19 February 1685	from	Francis Aston
L-157	45	84	5	30 March 1685	to	Members of the Royal Society
L-158			20	27 June 1685	from	Francis Aston
L-159	46	85	5	13 July 1685	to	Members of the Royal Society
L-160			20	3 August 1685	from	Anthonie Heinsius
L-161			20	9 August - 22 October 1685	from	Francis Aston
L-162		86	5	10 August 1685	to	Anthonie Heinsius
L-163			20	31 August 1685	from	Anthonie Heinsius
L-164		87	5	21 September 1685	to	Anthonie Heinsius
L-165			20	after 6 October 1685	from	Karl von Hessen-Kassel
L-166	47	88	5	12 October 1685	to	Members of the Royal Society
L-167		no #	7	17 December 1685	from	Constantijn Huygens
L-168	48	89	5	22 January 1686	to	Members of the Royal Society
L-169			20	12 March 1686	from	Thomas Gale
L-170			20	12 March 1686	from	Edmond Halley
L-171			20	15 March 1686 – 17 October 1687	from	a Prussian doctor
L-172			20	16 March 1686	from	Antonio Magliabechi
L-173	49	90	6	2 April 1686	to	Members of the Royal Society
L-174		91	6	14 April 1686	to	Antonio Magliabechi
L-175	50	92	6	14 May 1686	to	Members of the Royal Society

## APPENDICES

L-#	AvL #	AdB/ CL #	AdB/ CL vol			
L-176			20	25 May 1686	from	Edmond Halley
L-177	51	93	6	10 June 1686	to	Members of the Royal Society
L-178	52	94	6	10 July 1686	to	Members of the Royal Society
L-179			20	11 July 1686	from	Jacob Gronovius
L-180		95	6	10 September 1686	to	Daniël Papenbroek
L-181			20	10 September 1686	to	Antonio Magliabechi
L-182		96	6	30 October 1686	to	Antonio Magliabechi
L-183			20	October – end of 1686	from	Royal Society (Edmond Halley)
L-184			20	24 February 1687	from	Royal Society (Edmond Halley)
L-185		97	6	1 March 1687	to	James II, King of England
L-186	53	98	6	4 April 1687	to	Members of the Royal Society
L-187	54	99	6	9 May 1687	to	Members of the Royal Society
L-188	55	100	6	13 June 1687	to	Members of the Royal Society
L-189	56	101	6	11 July 1687	to	Members of the Royal Society
L-190	57	102	7	6 August 1687	to	Members of the Royal Society
L-191			20	6 August 1687	to	Robert Boyle
L-192	58	103	7	9 September 1687	to	Members of the Royal Society
L-193	59	104	7	17 October 1687	to	Members of the Royal Society
L-194	60	105	7	28 November 1687	to	Members of the Royal Society
L-195			20	1688	to	Robert Boyle
L-196	61	106	7	25 May 1688	to	Members of the Royal Society
L-197	62	107	7	6 July 1688	to	Members of the Royal Society
L-198	63	108	7	3 August 1688	to	Members of the Royal Society
L-199	64	109	7	24 August 1688	to	Members of the Royal Society

## APPENDICES

L-#	AvL #	AdB/ CL #	AdB/ CL vol			
L-200	65	110	8	7 September 1688	to	Members of the Royal Society
L-201		111	8	23 September 1688	to	Melchisedec Thevenot
L-202			20	1689	to	Antonio Magliabechi
L-203		112	8	12 January 1689	to	Robert Boyle
L-204	66	113	8	12 January 1689	to	Members of the Royal Society
L-205			20	6 March 1689	from	Christiaan Huygens
L-206	67	114	8	1 April 1689	to	Members of the Royal Society
L-207			20	October 1689	to	Christiaan Huygens
L-208			20	6 March 1690	from	Christiaan Huygens
L-209			20	27 May 1691	from	Antonio Magliabechi
L-210		115	8	18 September 1691	to	Antonio Magliabechi
L-211			20	21 September 1691	from	William Stanley
L-212	68	116	8	27 November 1691	to	Members of the Royal Society
L-213	69	117	8	4 January 1692	to	Members of the Royal Society
L-214	70	118	8	1 February 1692	to	Members of the Royal Society
L-215		no #	8 / 20	12 February 1692	from	Richard Waller
L-216	71	119	8	7 March 1692	to	Members of the Royal Society
L-217	72	120	9	22 April 1692	to	Richard Waller
L-218	73	121	9	24 June 1692	to	Members of the Royal Society
L-219			20	24 June 1692	from	Antonio Magliabechi
L-220	74	122	9	12 August 1692	to	Members of the Royal Society
L-221	75	123	9	16 September 1692	to	Members of the Royal Society
L-222		124	9	23 September 1692	to	Mary, Queen of Great Britain
L-223		no #	9	20 October 1692	from	Christiaan Huygens
L-224		no #	9	8 May 1693	from	Richard Waller
L-225		125	9	1 July 1693	to	Richard Waller
L-226		no #	9	18 August 1693	from	Pieter Rabus

## APPENDICES

L-#	AvL #	AdB/ CL #	AdB/ CL vol			
L-227		no #	9	3 September 1693	from	George Garden
L-228	76	126	9	15 October 1693	to	Members of the Royal Society
L-229		127	9	27 October 1693	to	Pieter Rabus
L-230		128	9	8 December 1693	to	Richard Waller
L-231	77	129	9	20 December 1693	to	Members of the Royal Society
L-232		130	9	19 January 1694	to	Richard Waller
L-233	78	131	9	24 January 1694	to	Members of the Royal Society
L-234		no #	9	10 February 1694	from	Richard Waller
L-235		132	9	12 February 1694	to	Richard Waller
L-236	79	133	9	24 February 1694	to	Members of the Royal Society
L-237		no #	10	28 February 1694	from	Benedict Haan
L-238			20	before 2 March 1694	from	Antonio Magliabechi
L-239	80	134	10	2 March 1694	to	Members of the Royal Society
L-240	81	135	10	19 March 1694	to	Members of the Royal Society; a reply to George Garden
L-241	82	136	10	2 April 1694	to	Members of the Royal Society
L-242	83	137	10	30 April 1694	to	Members of the Royal Society
L-243		no #	10	2 May 1694	from	Richard Waller
L-244		138	10	26 May 1694	to	Richard Waller
L-245	84	139	10	14 September 1694	to	Richard Waller
L-246	85	140	10	30 November 1694	to	Pieter Rabus
L-247	86	141	10	10 April 1695	to	Anthonie Heinsius
L-248	87	142	10	22 April 1695	to	Frederik Adriaan van Reede
L-249			20	May 1695	from	Frederik Adriaan van Reede
L-250			20	May 1695	from	Pieter Rabus
L-251	88	143	10	1 May 1695	to	Anthonie Heinsius
L-252			20	2 May 1695	from	Maarten Etienne van Velden

## APPENDICES

L-#	AvL #	AdB/ CL #	AdB/ CL vol			
L-253	89	144	10	18 May 1695	to	Frederik Adriaan van Reede
L-254		145	10	21 May 1695	to	Pieter Rabus
L-255		146	10	23 May 1695	to	Maarten Etienne van Velden
L-256			20	30 May 1695	from	Maarten Etienne van Velden
L-257			20	June 1695	from	Frederik Adriaan van Reede
L-258			20	21 June 1695	from	Pieter Rabus
L-259			20	before 12 July 1695	from	Angelus van Wikhuysen
L-260	90	147	10	10 July 1695	to	Frederik Adriaan van Reede
L-261		148	11	12 July 1695	to	Maarten Etienne van Velden
L-262	91	149	11	20 July 1695	to	Anthonie Heinsius
L-263		150	11	21 July 1695	to	Pieter Rabus
L-264	92	151	11	15 August 1695	to	Frederik Adriaan van Reede
L-265		152	11	1695	to	Antonio Magliabechi
L-266		153	11	16 August 1695	to	Antonio Magliabechi
L-267	93	154	11	18 August 1695	to	Anthonie Heinsius
L-268	94	155	11	20 August 1695	to	Frederik Adriaan van Reede
L-269			20	before September 1695	from	Angelus van Wikhuysen
L-270		156	11	10 September 1695	to	Pieter Rabus
L-271	95	157	11	18 September 1695	to	Johann W. von Pfalz-Neuburg
L-272			20	12 October 1695	from	Antonio Magliabechi
L-273			20	14 October 1695	from	Antonio Magliabechi
L-274		158	11	18 October 1695	to	Antonio Magliabechi
L-275			20	23 October 1695	from	Antonio Magliabechi
L-276		159	11	31 October 1695	to	Antonio Magliabechi
L-277				31 October 1695	to	Jacob Calckberner
L-278			20	before November 1695	from	His Excellency Mr. ...

## APPENDICES

L-#	AvL #	AdB/ CL #	AdB/ CL vol			
L-279	96	160	11	9 November 1695	to	Johann W. von Pfalz-Neuburg
L-280			20	5 November 1695	from	Antonio Magliabechi
L-281		161	11	December 1695	to	Frederik Adriaan van Reede
L-282		162	11	22 December 1695	to	Antonio Magliabechi
L-283	97	163	11	28 December 1695	to	Hendrik van Bleyswijk
L-284			20	17 February 1696	from	Royal Society (Hans Sloane)
L-285	98	164	11	20 February 1696	to	Frederik Adriaan van Reede
L-286			20	6 March 1696	from	Antonio Magliabechi
L-287	99	165	11	8 March 1696	to	Nicolaas Witsen
L-288		no #	11	16 May 1696	from	Pieter Rabus
L-289		166	11	1 June 1696	to	Pieter Rabus
L-290			20	5 June 1696	from	Antonio Magliabechi
L-291			20	March-July 1696	from	Nicolaas Witsen
L-292	100	167	11	6 July 1696	to	Nicolaas Witsen
L-293			20	8 July 1696	from	Antonio Magliabechi
L-294	101	168	11	10 July 1696	to	Nicolaas Witsen
L-295	102	169	11	10 July 1696	to	Members of the Royal Society
L-296	103	170	12	16 July 1696	to	Frederik Adriaan van Reede
L-297		171	12	23 July 1696	to	Pieter Rabus
L-298		no #	12	30 July 1696	from	Pieter Rabus
L-299			20	23 August 1696	from	Frederik Adriaan van Reede
L-300	104	172	12	26 August 1696	to	Frederik Adriaan van Reede
L-301		173	12	28 August 1696	to	Antonio Magliabechi
L-302	105	174	12	29 August 1696	to	Hendrik van Bleyswijk
L-303		175	12	7 September 1696	to	Antonio Magliabechi
L-304	106	176	12	12 September 1696	to	Anthonie Heinsius
L-305	107	177	12	27 September 1696	to	Hendrik van Bleyswijk
L-306		178	12	26 October 1696	to	Maarten Etienne van Velden

## APPENDICES

L-#	AvL #	AdB/ CL #	AdB/ CL vol			
L-307		179	12	30 October 1696	to	a gentleman from Brabant
L-308		no #	12	November 1696	from	a gentleman from Brabant
L-309		180	12	latter part of 1696	to	Harmen van Zoelen
L-310			20	18 December 1696	from	Antonio Magliabechi
L-311			20	18 December 1696	from	Hans Sloane
L-312			20	1697	from	Gottfried Leibniz
L-313			20	4 February 1697	from	Maarten Etienne van Velden
L-314		181	12	12 February 1697	to	Maarten Etienne van Velden
L-315		182	12	19 February 1697	to	Hans Sloane
L-316		183	12	25 March 1697	to	Members of the Royal Society
L-317			20	a few months before April 1697	from	Pieter vander Slaart
L-318	108	184	12	5 April 1697	to	Members of the Royal Society
L-319			20	February-May 1697	from	Antonio Magliabechi
L-320			20	May 1697	to	Victor van Beughem
L-321			20	17 May 1697	from	John Harwood (Royal Society)
L-322			20	1 June 1697	from	Antonio Magliabechi
L-323		185	12	6 June 1697	to	Antonio Magliabechi
L-324		186	12	July 1697	to	Luca Giamberti
L-325			20	19 July 1697	from	Luca Giamberti
L-326			20	August 1697	from	Antonio Magliabechi
L-327			20	18 August 1697	from	Jan van Leeuwen
L-328	109	187	12	3 September 1697	to	Jan van Leeuwen
L-329	110	188	12	10 September 1697	to	Members of the Royal Society
L-330		189	12	2 November 1697	to	Antonio Magliabechi
L-331		190	12	late December 1697-15 January 1698	to	Johan Arnoldi
L-332			20	late 1697 early 1698	from	Antonio Magliabechi
L-333			20	15 January 1698	from	Johan Arnoldi



## APPENDICES

L-#	AvL #	AdB/ CL #	AdB/ CL vol			
L-334			20	19 January 1698	to	Govert Bidloo
L-335			20	February 1698	to	Johan Arnoldi
L-336		191	12	20 February 1698	to	Antonio Magliabechi
L-337			20	March 1698	from	Antonio Magliabechi
L-338			20	21 March 1698	from	Govert Bidloo
L-339			20	early April 1698	from	Johan Arnoldi
L-340			20	April 1698	to	Johan Arnoldi
L-341			20	April 1698	to	Harmen van Zoelen
L-342		192	12	17 April 1698	to	Antonio Magliabechi
L-343	111	193	12	9 May 1698	to	Members of the Royal Society
L-344			20	June 1698	from	Antonio Magliabechi
L-345			20	9 June 1698	from	Robert Hooke
L-346		194	12	14 August 1698	to	Antonio Magliabechi
L-347	112	195	12	20 September 1698	to	Anthonie Heinsius
L-348			20	27 November 1698	from	Fortunato Vinaccesi
L-349	113	196	12	17 December 1698	to	Harmen van Zoelen
L-350			20	late 1698	from	Antonio Magliabechi
L-351			20	February 1699	from	Johan Arnoldi
L-352	114	197	12	1 February 1699	to	N.N. Right Honourable Sir
L-353			20	15 February 1699	to	Johan Arnoldi
L-354		198	12	28 February 1699	to	Antonio Magliabechi
L-355	115	199	12	26 April 1699	to	Harmen van Zoelen
L-356	116	200	12	9 June 1699	to	Members of the Royal Society
L-357	117	201	12	23 June 1699	to	Members of the Royal Society
L-358	118	202	12	5 August 1699	to	N.N. directors of the United East India Company in Delft
L-359			20	8 September 1699	from	Antonio Magliabechi
L-360		203	12	25 September 1699	to	Hans Sloane
L-361	119	204	12	25 September 1699	to	Members of the Royal Society

## APPENDICES

L-#	AvL #	AdB/ CL #	AdB/ CL vol			
L-362	120	205	12	October 1699	to	Ehrenfried W. von Tschirnhaus
L-363	121	206	12	16 October 1699	to	Antonio Magliabechi
L-364	122	207	13	2 January 1700	to	Hans Sloane
L-365	123	208	13	14 January 1700	to	Nicolaas Bogaert van Belois
L-366	124	209	13	20 May 1700	to	Hendrik van Bleyswijk
L-367	126	210	13	20 May 1700	to	Anthonie Heinsius
L-368	125	211	13	2 June 1700	to	Frederik Adriaan van Reede
L-369		no #	13	8 June 1700	from	Hans Sloane
L-370	127	212	13	14 June 1700	to	Hans Sloane
L-371	133	213	13	16 June 1700	to	N.N. Highly Learned Sir
L-372	128	214	13	9 July 1700	to	Hans Sloane
L-373	129	215	13	10 July 1700	to	Anthonie Heinsius
L-374			20	15 July 1700	from	Hans Sloane
L-375	130	216	13	27 July 1700	to	Hans Sloane
L-376	131	217	13	August 1700	to	N.N. Your Most Serene Highness
L-377	132	218	13	7 September 1700	to	Hans Sloane
L-378	134	219	13	26 October 1700	to	Hans Sloane
L-379			20	29 November 1700	from	Hans Sloane
L-380	135	220	13	25 December 1700	to	Hans Sloane
L-381			20	mid-1701	from	Antonio Magliabechi
L-382	136	221	13	28 January 1701	to	Hans Sloane
L-383		222	13	9 February 1701	to	Frederik Adriaan van Reede
L-384		223	13	8 April 1701	to	N.N. Mayors and governors of Delft
L-385	137	224	13	15 April 1701	to	Members of the Royal Society
L-386			20	24 April 1701	from	John Chamberlayne
L-387			20	24 April 1701	from	Hans Sloane
L-388			20	20 May 1701	from	Hans Sloane
L-389		225	13	21 June 1701	to	John Chamberlayne

## APPENDICES

L-#	AvL #	AdB/ CL #	AdB/ CL vol			
L-390	138	226	13	21 June 1701	to	Members of the Royal Society
L-391	139	227	13	21 June 1701	to	Hans Sloane
L-392	140	228	14	2 August 1701	to	Members of the Royal Society
L-393	141	229	14	26 August 1701	to	Frederik Adriaan van Reede
L-394		no #	14	27 September 1701	from	Hans Sloane
L-395			20	15 November 1701	from	John Somers
L-396		no #	14	18 November 1701	from	Hans Sloane
L-397		230	14	6 December 1701	to	Hans Sloane
L-398	142	231	14	6 December 1701	to	John Somers
L-399	143	232	14	20 December 1701	to	Members of the Royal Society
L-400	144	233	14	9 February 1702	to	Hendrik van Bleyswijk
L-401	145	234	14	14 February 1702	to	Members of the Royal Society
L-402			20	before April 1702	from	Hans Sloane
L-403	146	235	14	20 April 1702	to	Karl von Hessen-Kassel
L-404	146	236	14	20 April 1702	to	Karl von Hessen-Kassel
L-405		237	14	28 April 1702	to	Members of the Royal Society
L-406			20	12 September 1702	from	John Chamberlayne
L-407		238	14	8 December 1702	to	John Chamberlayne
L-408		239	14	25 December 1702	to	Members of the Royal Society
L-409		240	14	5 February 1703	to	Members of the Royal Society
L-410		241	14	26 February 1703	to	Members of the Royal Society
L-411			20	before November 1703	from	Hans Sloane
L-412		242	14	3 November 1703	to	Hans Sloane
L-413		243	14	3 November 1703	to	Members of the Royal Society
L-414		244	14	4 December 1703	to	Members of the Royal Society

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L-#	AvL #	AdB/ CL #	AdB/ CL vol			
L-415		245	14	8 January 1704	to	Members of the Royal Society
L-416		246	14	1 February 1704	to	Members of the Royal Society
L-417			20	7 February 1704	from	Siewert Centen
L-418		247	14	11 February 1704	to	Petrus Valckenier
L-419			20	mid-February 1704	to	Siewert Centen
L-420			20	late February-early March 1704	from	Siewert Centen
L-421			20	March-July 1704	from	Hans Sloane
L-422		248	14	21 March 1704	to	Members of the Royal Society
L-423		249	15	22 July 1704	to	Members of the Royal Society
L-424			20	September 1704	from	Pieter Hotton
L-425			20	September 1704	to	Pieter Hotton
L-426		250	15	16 September 1704	to	Members of the Royal Society
L-427		251	15	3 October 1704	to	John Chamberlayne
L-428		252	15	4 November 1704	to	Members of the Royal Society
L-429			20	2 December 1704	from	Hans Sloane
L-430			20	2 December 1704	from	John Chamberlayne
L-431		253	15	13 December 1704	to	Members of the Royal Society
L-432			20	13 February 1705	from	Hans Sloane
L-433		254	15	3 March 1705	to	Members of the Royal Society
L-434		255	15	3 March 1705	to	John Chamberlayne
L-435			20	before 12 March 1705	from	Antonio Magliabechi
L-436		256	15	12 March 1705	to	Antonio Magliabechi
L-437		257	15	27 March 1705	to	Members of the Royal Society
L-438		258	15	24 April 1705	to	Members of the Royal Society
L-439		259	15	25 May 1705	to	Members of the Royal Society
L-440			20	10 November 1705	from	Royal Society (Hans Sloane)

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L-#	AvL #	AdB/ CL #	AdB/ CL vol			
L-441		260	15	18 December 1705	to	Francesco Corner
L-442		261	15	29 December 1705	to	Members of the Royal Society
L-443			20	end 1705 early 1706	from	Francesco Corner
L-444		262	15	7 March 1706	to	Govert Bidloo
L-445			20	12 March 1706	from	Govert Bidloo
L-446		263	15	19 March 1706	to	Members of the Royal Society
L-447		264	15	20 April 1706	to	Members of the Royal Society
L-448		265	15	1 June 1706	to	Members of the Royal Society
L-449		266	15	1707	to	Angelus van Wikhuisen
L-450			20	31 March 1707	from	John Chamberlayne
L-451			20	4 May 1707	from	Hans Sloane
L-452		267	15	17 May 1707	to	John Chamberlayne
L-453			20	3 June 1707	from	Royal Society (Hans Sloane)
L-454		268	15	5 July 1707	to	Members of the Royal Society
L-455		269	15	12 July 1707	to	Members of the Royal Society
L-456			20	15 July 1707	from	Angelus van Wikhuisen
L-457		270	16	25 July 1707	to	Members of the Royal Society
L-458		271	16	10 August 1707	to	Anthonie Heinsius
L-459		272	16	18 October 1707	to	Members of the Royal Society
L-460			20	4 November 1707	from	Royal Society (Hans Sloane)
L-461		273	16	22 November 1707	to	Members of the Royal Society
L-462		274	16	6 December 1707	to	Members of the Royal Society
L-463		275	16	December 1707 / early 1708	to	Members of the Royal Society
L-464		276	16	29 June 1708	to	Members of the Royal Society

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L-#	AvL #	AdB/ CL #	AdB/ CL vol			
L-465		20	10 July 1708	from	Antonio Magliabechi	
L-466		20	before 28 August 1708	from	Royal Society (Hans Sloane)	
L-467	277	16	28 August 1708	to	Members of the Royal Society	
L-468	278	16	9 October 1708	to	Members of the Royal Society	
L-469		20	13 August 1709	from	John Chamberlayne	
L-470	279	16	10 September 1709	to	Hans Sloane	
L-471	280	16	10 September 1709	to	John Chamberlayne	
L-472	281	16	22 November 1709	to	John Chamberlayne	
L-473		20	late 1709	from	Hans Sloane	
L-474	282	16	14 January 1710	to	Members of the Royal Society	
L-475	283	16	21 February 1710	to	Members of the Royal Society	
L-476	284	16	6 June 1710	to	Members of the Royal Society	
L-477	285	16	11 November 1710	to	Members of the Royal Society	
L-478		20	13 August 1711	from	James Petiver	
L-479	286	16	15 August 1711	to	Anthonie Heinsius	
L-480	287	16	18 August 1711	to	James Petiver	
L-481	288	16	22 September 1711	to	Members of the Royal Society	
L-482	289	16	23 November 1711	to	Anthonie Heinsius	
L-483	290	16	29 December 1711	to	Anthonie Heinsius	
L-484	291	16	29 December 1711	to	Anthonie Heinsius	
L-485	292	16	1 March 1712	to	Members of the Royal Society	
L-486	293	16	12 April 1712	to	Members of the Royal Society	
L-487	294	16	10 June 1712	to	Members of the Royal Society	
L-488		295	17	8 November 1712	to	Anthonie Heinsius
L-489	I	296	17	8 November 1712	to	Anthonie Heinsius
L-490	II	297	17	17 December 1712	to	Anthonie Heinsius

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L-#	AvL #	AdB/ CL #	AdB/ CL vol			
L-491			20	a few years before 1713	to	Jan Meerman
L-492	III	298	17	28 February - March 1713	to	Jan Meerman
L-493	IV	299	17	14 March 1713	to	Jan Meerman
L-494	V	300	17	25 March 1713	to	Adriaen van Assendelft
L-495	VI	301	17	29 March 1713	to	Anthonie Heinsius
L-496	VII	302	17	28 June 1713	to	Members of the Royal Society
L-497	VIII	303	17	30 June 1713	to	Anthonie Heinsius
L-498			20	October 1713	from	Antoni Cink
L-499		304	17	12 October 1713	to	Hans Sloane
L-500			20	24 October 1713	from	Hans Sloane
L-501	IX	305	17	24 October 1713	to	Antoni Cink
L-502			20	3 March 1714	from	Richard Waller
L-503			20	8 March 1714	from	Royal Society (Richard Waller)
L-504	X	306	17	22 June 1714	to	Members of the Royal Society
L-505			20	19 July 1714	from	Richard Waller
L-506			20	27 July 1714	from	Richard Waller
L-507	XI	307	17	21 August 1714	to	Members of the Royal Society
L-508			20	30 August 1714	from	Richard Waller
L-509	XII	308	17	26 October 1714	to	Members of the Royal Society
L-510	XIII	309	17	4 November 1714	to	Adriaen van Assendelft
L-511			20	9 November 1714	to	Isaac Newton
L-512	XIV	310	17	9 November 1714	to	Members of the Royal Society
L-513	XV	311	17	20 November 1714	to	Members of the Royal Society
L-514		312	17	11 January 1715	to	Anthonie Heinsius
L-515		313	17	28 February 1715	from	Anthonie Heinsius
L-516	XVI	314	17	26 March 1715	to	Antoni Cink
L-517			20	2 July 1715	from	Antoni Cink

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L-#	AvL #	AdB/ CL #	AdB/ CL vol			
L-518	XVII	315	17	7 July 1715	to	Antoni Cinck
L-519						cancelled
L-520		316	17	5 August 1715	from	Gottfried Leibniz
L-521	XVIII	317	17	28 September 1715	to	Gottfried Leibniz
L-522		318	17	29 October 1715	from	Gottfried Leibniz
L-523		319	17	18 November 1715	to	Gottfried Leibniz
L-524	XIX	320	17	18 November 1715	to	Gottfried Leibniz
L-525			20	some years before 1716	to	Frederik Adriaan van Reede
L-526		321	17	25 February 1716	to	Anthonie Heinsius
L-527	XX	322	17	3 March 1716	to	Gottfried Leibniz
L-528		323	17	31 March 1716	from	Gottfried Leibniz
L-529			20	May 1716	from	Cornelis Spiering
L-530	XXI	324	17	10 May 1716	to	Hubert Kornelis Poot
L-531	XXII	325	17	16 May 1716	to	Gerard van Loon
L-532	XXIII	326	17	19 May 1716	to	Gottfried Leibniz
L-533	XXIV	327	17	22 May 1716	to	Cornelis Spiering
L-534			18	24 May 1716	from	Antony Cinck, Ursmer Narez, Hendrik Jozef Rega
L-535			18	3 June 1716	by	Jacob van der Werff (notary testimony)
L-536	XXV		18	12 June 1716	to	Antony Cinck, Ursmer Narez, Hendrik Jozef Rega
L-537	XXVI		18	22 June 1716	to	Jan Gerard Kerkherdere
L-538	XXVII		18	17 September 1716	to	Abraham van Bleyswyck
L-539			18	25 or 26 September 1716	from	Gottfried Leibniz
L-540	XXVIII		18	28 September 1716	to	Herman Boerhaave
L-541			18	10 October 1716	from	Herman Boerhaave
L-542			18	4 November 1716	from	Herman Boerhaave
L-543			18	4 November 1716	from	Abraham van Bleyswyck to Herman Boerhaave



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L-#	AvL #	AdB/ CL #	AdB/ CL vol		
L-544	XXIX	18	5 November 1716	to	Herman Boerhaave
L-545	XXX	18	17 November 1716	to	Gottfried Leibniz
L-546	XXXI	18	21 November 1716	to	Herman Boerhaave
L-547	XXXII	18	2 March 1717	to	Abraham Cornelis van Bleyswyck
L-548	XXXIII	18	6 March 1717	to	N.N. Members of the Royal Society
L-549	XXXIV	18	6 March 1717	to	N.N. Members of the Royal Society
L-550	XXXV	18	6 May 1717	to	Ewout van Bleyswyck
L-551	XXXVI	18	26 May 1717	to	Abraham van Bleyswyck
L-552	XXXVII	18	15 June 1717	to	Members of the Royal Society
L-553	XXXVIII	18	6 July 1717	to	Antony Cinck, Ursmer Narez, Hendrik Jozef Rega
L-554	XXXIX	18	13 July 1717	to	Jan Gerard Kerkherdere
L-555		18	August 1717	from	Adriaan Swalmius
L-556	XL	18	19 August 1717	to	Adriaan Swalmius
L-557	XLI	18	26 August 1717	to	Herman Boerhaave
L-558	XLII	18	10 September 1717	to	Frederik Adriaan van Reede
L-559	XLIII	18	17 September 1717	to	Members of the Royal Society
L-560	XLIV	18	8 October 1717	to	Members of the Royal Society
L-561	XLV	18	22 October 1717	to	Members of the Royal Society
L-562	XLVI	18	20 November 1717	to	Members of the Royal Society
L-563		18	8 December 1717	to	Charles VI
L-564		18	28 November 1718	to	Francisco Cornaro
L-565		18	9 January 1720	to	Members of the Royal Society
L-566		19	20 November 1720	to	Members of the Royal Society
L-567		19	15 January 1721	to	Members of the Royal Society

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L-#	AvL #	AdB/ CL #	AdB/ CL vol		
L-568		19	24 January 1721	to	Members of the Royal Society
L-569		19	11 April 1721	to	Members of the Royal Society
L-570		19	27 June 1721	to	Members of the Royal Society
L-571		19	5 March 1722	from	James Jurin
L-572		19	21 April 1722	to	Members of the Royal Society
L-573		19	1 May 1722	to	Members of the Royal Society
L-574		19	1 May 1722	to	James Jurin
L-575		19	26 May 1722	from	James Jurin
L-576		19	13 June 1722	to	Members of the Royal Society
L-577		19	13 June 1722	to	James Jurin
L-578		19	7 July 1722	to	Members of the Royal Society
L-579		19	7 July 1722	to	James Jurin
L-580		19	12 October 1722	from	James Jurin
L-581		19	20 November 1722	to	James Jurin
L-582		19	4 January 1723	from	James Jurin
L-583		19	19 March 1723	to	Members of the Royal Society
L-584		19	19 March 1723	to	James Jurin
L-585		19	31 May 1723	to	Members of the Royal Society
L-586		19	6 July 1723	from	James Jurin
L-587		19	August 1723	to	James Jurin
L-588		19	August 1723	to	James Jurin
L-589		19	30 August 1723	from	Peter Gribius to James Jurin
L-590		19	4 September 1723	from	Johannes Hoogvliet to James Jurin
L-591		19	4 October 1723	from	Maria van Leeuwenhoek to the Royal Society
L-592		19	4 October 1723	from	Peter Gribius to James Jurin

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L-#	AvL #	AdB/ CL #	AdB/ CL vol		
L-593		19	12 October 1723	from	James Jurin to Peter Gribius
L-594		19	20 October 1723	from	Arnout van den Berch to the Royal Society
L-595		19	18 November 1723	from	Isaac Newton to Abraham Edens
L-596		19	29 November 1723	from	James Jurin to Maria van Leeuwenhoek
L-597		19	29 November 1723	from	James Jurin to Arnout van den Berch
L-598		19	29 November 1723	from	James Jurin to Peter Gribius
L-599		19	late 1723	by	Martin Folkes
L-600		19	13 June 1724	from	James Jurin to Arnout van den Berch
L-601		19	13 June 1724	from	James Jurin to Maria van Leeuwenhoek

## LIST OF CITED LITERATURE\*

- Alle de Brieven van Antoni van Leeuwenhoek / The Collected Letters of Antoni van Leeuwenhoek*, 20 vols. (Amsterdam/Lisse: Swets & Zeitlinger/Taylor and Francis/Huygens Institute (KNAW), 1939-2024).
- ADAMS, A., "A letter from Dr. Archibald Adams to Dr. Hans Sloane, R. S. Secr. concerning the manner of making Microscope, &c," *Philosophical Transactions*, vol. 27, no. 325 (March 1710), pp. 24-27.
- ANDERSON, D., Website 'Lens on Leeuwenhoek', <https://lensonleeuwenhoek.net>.
- , "“Your most humble servant”: the letters of Antony van Leeuwenhoek", *FEMS Microbiology Letters*, 369:1 (2022).
- ANDERSON, J., *Nachrichten von Island, Grönland und der Strasse Davis* (Potsdam: Becker, 1746), Dutch translation, *Beschryving van Ysland, Groenland en de Straat Davis* (Amsterdam: Van Esveldt, 1750), 'voorbericht'.
- ANTOGNAZZA, M., *Leibniz: An Intellectual Biography* (Cambridge: Cambridge Univ. Press, 2009).
- BARBA, A., *Arte de los Metales, seguido de notas y suplementos al libro por un antiguo minero. Juicios y comentarios* (Madrid, La Imprenta del Reyno, 1649). Translated into English by the Earl of Sandwich as *The art of metals in which is declared the manner of their generation and the concomitants of them* (London: Mearne, 1674).
- BARTHOLIN, T., *Acta medica et philosophica Hafniensia* (Hafniae: Haubold, 1673).
- BECCHI, A., "Between learned science and technical knowledge. Leibniz, Leeuwenhoek and the School for Microscopists", in: STRICKLAND, L., VYNCKIER, E., WECKEND, J., eds., *Tercentenary Essays on the Philosophy and Science of Leibniz* (Palgrave Macmillan, 2017), pp. 47-80.
- BEYDALS, P., "Leeuwenhoek-brief no.-27 en andere gegevens", *Nederlandsch tijdschrift voor geneeskunde*, 77- I (1933), pp 522-527.
- , "Twee Testamenten van Antoni van Leeuwenhoek", *Nederlandsch tijdschrift voor geneeskunde*, 77-I (1933), pp. 1021-1033.
- BIDLOO, G., *Brief van G. Bidloo, aan Antony van Leeuwenhoek; Wegens de dieren welke men zomtijds in de lever der schapen en andere beesten vind* (Delft: Van Kroonevelt, 1698).
- BIE, C. DE, *Faems weer-galm der Neder-duytsche poësie van Cornelio de Bie* (Mechelen: Jay, 1670).
- BIRCH, T., *The history of the Royal Society of London for improving of natural knowledge*, 4 volumes (London: Millar, 1756-1757).
- , ed., *The works of the honourable Robert Boyle*, 5 vols. (London: Millar, 1744).
- BONTEKOE, C., *Reden over de koortzen* ('s Gravenhage: Haagen, 1682).
- BORELLI, G., *On the Movement of Animals [De Motu Animalium]*, PAUL MAQUET, trans. (Berlin: Springer-Verlag, 1989).
- BOWDLER, B. & WEDUWEN, A. DER, "The ambassador and the press: printed diplomatic letters and the entanglement of public and private news provision in the late seventeenth-century Dutch Republic", *The Seventeenth Century*, 39:1 (2024), pp. 115-141.
- BRUNE, J. DE, *Wetsteen der vernuftten, oft Bequaem middel, om van alle voorvallende zaken, aardighlijk te leeren spreken*, (Amsterdam: Schipper, 1658).

---

\* This list excludes the works that GOVERT BIDLOO references in Letter L-338 of 21 March 1698, in this volume.

- BRUYN KOPS, H. DE, *A spirited exchange. The wine and brandy trade between France and the Dutch Republic in its Atlantic framework, 1600-1650* (Leiden/Boston: Brill, 2007).
- COBB, M., *The egg and sperm race: the seventeenth-century scientists who unravelled the secrets of sex, life and growth* (London: Pocket Books, 2007). Published in the U.S. as *Generation: The seventeenth-century scientists who unraveled the secrets of sex, life, and growth* (New York: Bloomsbury, 2006).
- CORDERIUS, M., *Colloquia Scholastica* (London: S. Griffin, for the Company of Stationer, 1667).
- CROONE, W., *De ratione motus musculorum* (London: Hayes, 1664).
- CROZE, J. DE LA, ed., *Memoirs for the Ingenious* (London: Rhodes and Harris, 1693).
- DOBELL, C., *Antony van Leeuwenhoek and his "Little Animals". Being some account of the father of protozoology and bacteriology and his multifarious discoveries in those disciplines* (Amsterdam: Swets & Zeitlinger, 1932).
- , "The Discovery of the Intestinal Protozoa of Man", *Proceedings of the Royal Society of Medicine*, 13 (sect. Hist. Med.), 1920, pp. 1-15.
- DUTENS, L., ed., *Gothofredi Guillelmi Leibnitii ... Opera omnia, nunc primum collecta, in classes distributa, praefationibus & indicibus exornata, studio Ludovici Dutens, vol. 2* (Geneva: Fratres de Tournes, 1768).
- EGERTON, F. N. "Richard Bradley's illicit excursion into medical practice in 1714", *Medical History*, 14: 1 (1970), pp. 53-62.
- ELSEN, J. VAN DEN, "The Rotterdam sympathy case (1696-1697): a window on the late seventeenth-century philosophical discourse", *Aries*, 2: 1 (2002), pp. 34-56.
- FARRINGTON, J., *An account of a journey through Holland, Frizeland, etc. in severall letters to a friend, to Mr. N.H., P. HOFHIJZER* (ed.) (Leiden: Academic Press, 1994).
- FORD, BRIAN J., "What were the missing Leeuwenhoek microscopes really like?", *Proceedings of the Royal Microscopical Society*, 18:2: (1983), pp. 118-124.
- FOURNIER, M., "Zo Leeuwenhoek, zo Leeuwenhoek-Commissie", *Gevina*, 13: 4 (1990), pp. 265-271.
- GEBHARD, J.F., *Het Leven van Mr. Nicolaas Cornelisz. Witsen (1641-1717)* (Utrecht: Leeftang, 1882).
- GRAAF, R. DE, *De mulierum organis generationi inservientibus tractatus novus: demonstrans tam homines & animalia caetera omnia, quae vivipara dicuntur, haud minus quàm ovipara ab ovo originem ducere* (Leiden: Hack, 1672).
- GREGORY, D., *Dr. Gregory's Elements of Catoptrics and Dioptrics*, W. BROWN, trans. (London: Curll, 1695).
- GREW, N., *Musaeum Regalis Societatis, or, A catalogue & description of the natural and artificial rarities belonging to the Royal Society and preserved at Gresham Colledge*, (London: Rawlins, 1681).
- HAAXMAN, P.J., *Antony van Leeuwenhoek. De Ontdekker der Infusorien 1675-1875* (Leiden: Van Doesburgh, 1875).
- , "Het Leven van een Groot Natuuronderzoeker", *Nederlandsch Tijdschrift voor Geneeskunde*, 7 (1871), pp. 1-86.
- HALL, A. RUPERT. "Further Newton Correspondence", *Notes and Records of the Royal Society of London*, 37: 1, (1982), pp. 7-34.
- HALL, R. & TILLING, L., eds., *The Correspondence of Isaac Newton 1713-1718*, vol. 6, (Cambridge: Cambridge University Press, 1976).
- HALL, M.B., "Frederick Slare, F.R.S. (1648-1727)", *Notes and Records of the Royal Society of London*, 46:1 (1992), pp. 23-41.
- HALL, RUPERT A. and MARIE BOAS HALL (eds.), *The Correspondence of Henry Oldenburg*, 13 vols (Madison, WI: University of Wisconsin Press /London: Mansel / Taylor & Francis, 1965-1986).

- HALBERTSMA, H., "Johan Ham van Arnhem, de ontdekker der spermatozoiden", *Verslagen en mededeelingen der Koninklijke Akademie van Wetenschappen. Afd. Natuurkunde*, 13 (1862), pp. 342-347.
- HARTSOEKER, N., "Extrait Critique" in: *Cours de Physique* (Den Haag: Swart, 1730).
- HARVEY, W., *Exercitationes de Generatione Animalium. Quibus accedunt quaedam De Partu: de Membris ac humoribus uteri: & de Conceptione* (Amsterdam: Elsevier, 1651).
- HENDERSON, F., "Making 'The good old man' speak English: The reception of Antoni van Leeuwenhoek's letters at the Royal Society, 1673-1723", in: COOK, H., *Translating Knowledge in the Early Modern Low Countries* (Berlin: LIT Verlag, 2013), pp. 243-268.
- HENIGER, J., "Antoni van Leeuwenhoek en zijn diploma van de Royal Society", *Tijdschrift voor de Geschiedenis der Geneeskunde, Natuurwetenschappen, Wiskunde en Techniek*, 1:4 (1979), pp. 157-169.
- HOOKE, R., *Lectures and Collections. Cometa, Microscopium* (London: Martyn 1678).
- HERMANN, P., *Musaeum Zeylanicum sive catalogus plantarum in Zeylana sponte nascentium, observatarum & descriptarum* (Leiden: Severius, 1717).
- HOOKE, R., "Dr. Hooke's Discourse concerning Telescopes and Microscopes; with a short account of their Inventors, read in February 1691-2", in: DERHAM, W., ed., *Philosophical Experiments and Observations* (London: Royal Society, 1726).
- , *Micrographia: or some physiological descriptions of minute bodies made by magnifying glasses* (London: Martyn and Allestry, 1665).
- HOOIJMAIJERS, H. & ZUIDERVAART, H.J., "The History of the Oldest Planetarium in the Netherlands: The *Sphaera Movens*, nicknamed the *Leyden Sphaera*", *Bulletin of the Scientific Instrument Society*, No. 133 (2017), pp. 13-24.
- HOUTZAGER, H.L., "Cornelis Isaacsz. 's - Gravesande en het medisch gezelschap in Delft", *Medisch Contact*, no. 23 (June 1977), pp. 745-747.
- , "Lambert van Veldhuyzen en zijn contacten met geleerde tijdgenoten", *Oud-Utrecht*, 58 (1985), pp. 28-30.
- HOUTZAGER, H.L. and J.R. VAN DER MOLEN, "Een porseleinen eerbetoon aan Anthonie van Leeuwenhoek", *Antiek: tijdschrift voor liefhebbers en kenners van oude kunst en kunstnijverheid*, 17 (1983), pp. 252-262.
- HUNTER, M.; CLERICUZIO, A. & PRINCIPE, L.M (eds.), *The Correspondence of Robert Boyle, 1636-1691*, 6 vols. (London: Pickering & Chatto, 2001).
- HUYGENS, C., *Oeuvres Complètes. Tome VIII. Correspondence 1676-1684* (ed. JOHANNES BOSSCHA jr.). (The Hague: Nijhoff, 1899).
- ITERSON, G. VAN, "A Discussion of Leeuwenhoek's Drawings and Descriptions in His Letter of 12 January 1680, as Compared with Those by Marcellus Malpighi and Nehemiah Grew of Corresponding Objects", *Collected Letters*, 3 (1948), pp. 435-441.
- JANSEN, J. (ed.), *Letter from G. Bidloo to Antony van Leeuwenhoek* (Nieuwkoop: De Graaf, 1972). – Dutch facsimile with complete English translation.
- JARVIS, C.E. & COULTON, R., "A Chronology of the Life of James Petiver (ca 1663–1718)", *Notes and Records of the Royal Society*, 74:22 (2020), pp. 183–187.
- JEDLITSCHKA, KARSTEN, "The Archive of the German Academy of Sciences Leopoldina in Halle (Saale): more than 350 years of the history of science", *Notes and Records of the Royal Society of London*, 62:2 (2008), pp. 237-244.
- KING, P., *Life of John Locke: With Extracts from His Correspondence, Journals, and Common-place Books* (London: Colburn, 1829).
- KIRCHER, A., *D'Onder-aardse Weereld in Haar Goddelijk Maaksel en wonderbare uitwerkselen aller Dingen* (Amsterdam: Janssonius van Waasberge, 1682). Dutch translation of *Mundus subterraneus* (1665).

- KOOIJMANS, L., *Vriendschap ende kunst van het overleven in de zeventiende en achttiende eeuw* (Amsterdam: Bakker, 1997).
- LAMMERS, J.W.J., 'Johan Ham, de ontdekker van de zaaddiertjes', *Nederlands Tijdschrift voor Geneeskunde* 118:21 (1974), pp. 784-788.
- LA ROQUE, J. (ed.), *Journal de médecine ou observations des plus fameux médecins, chirurgiens et anatomistes de l'Europe* (Paris: Cusson & d Houry, 1683).
- LEE, S., (ed.), "Vernon, James (1646-1727)", *Dictionary of National Biography*, vol. LVIII *Ubal dini to Wakefield* (London: Smith, Elder, & Co., 1899), pp. 277-278.
- LEEUWENHOEK, A., *Anatomia seu interiora rerum* (Leiden: Boutesteyn, 1687).
- , *Arcana Naturae Detecta* (Delft: Krooneveld, 1695).
- , *Den waaragtigen omloop des bloeds Als mede dat de Arterien en Venæ Gecontinueerde Bloed-Vaten zijn* (Delft: Voorstad, 1688).
- , *Ondervindingen en Beschouwingen der onsigtbare geschapene waarheden vervat in verscheydene Brieven, geschreven aan de Wijt-beroemde Koninklijke Societeit in Engeland, etc.* (Leiden: Van Gaesbeeck, 1684).
- , *Ondervindingen en Beschouwingen der onsigbare geschapene waarheden, waar in gehandeld werd Over het maaksel van 't Humor Cristallinus, so van verschejde dieren, vogelen, ende visschen, het draad-agtig wesen dat in 't oog voor komt, de vogtigheyd op het Hoorn-vlies, het maaksel van een klein bloed-aderken, ende de opperste huyd van een swarte Morinne, etc.* (Leiden: Van Gaesbeeck, 1684).
- , *Ondervindingen en Beschouwingen der onsigbare geschapene waarheden, Waar in gehandeld werd vande Eyerstok ende derselver ingebeelde Eyeren, dat een Mensch uit een Dierken voort komt, vande samen stremminge, Saden in een Boom, hoe een Dierken in 't Saad van een Haan, Cabbeljaau &c. 't Vlees uyt de Borst en Poten van een Vloy, Testicul, Respiratie, en Wormkens uyt de Eyeren vande Vloy, Vlees uyt de Poten van Vliegen, Sal-volatile Oliosum met Bloed vermengt, geen gistinge in 't Bloed ende de makinge van het selfde, etc.* (Leiden: Van Gaesbeeck, 1684).
- , *Ondervindingen en Beschouwingen der onsigbare geschapene waarheden, waar in gehandelt wert vande Schobbens inde Mond, de Lasarie, de Jeuking 't Kind met Vis-Schobbens, 't binnenste der Darmen, en de beweging derselve, als mede het Vet dat inde selve gevonden wert, etc.* (Leiden: Van Gaesbeeck, 1684).
- , *Ontledingen en Ontdekkingen van de Cinnaber naturalis, en Bus-poeder; van het maaksel van Been en Hynd; van de Galnoot, Kastanie en Okkernoot; van de Voortteeling van eenige Saden, Vergeleken by de Voortteeling van Garnaad, Krabbe en Kreeft; Waar in de deugdszaamheid van het Eyken-hout bestaat, en hoe het te kennen is, etc.* (Leiden: Boutesteyn, 1686).
- , *Ontledingen en Ontdekkingen van Levende Dierkens in de Teel-deelen van verschejde Dieren, Vogelen en Visschen; van het Hout met der selver meningvuldige Vaaten; Van Hair, Vlees en Vis; Als mede van de groote menigte der Dierkens in de Excrementen, etc.* (Leiden: Boutesteyn, 1686).
- , *Vervolg der Brieven, geschreven aan de Wytvermaarde Koninklijke societeit tot Londen* (Leiden: Boutesteyn, 1687).
- LEIBNIZ, G., *Allgemeiner Politischer und Historischer Briefwechsel*, vol. 14 [ May-December 1697 ] , and vol. 15 [ January-September 1698 ], (Berlin: Akademie Verlag, 1998).
- LOCKE, J., *Essay Concerning Human Understanding* (London: Mory, 1690).
- LOON, G. VAN, *Beschrijving der Nederlandsche Historiepenningen*, vol. 3 ('s Gravenhage: Van Lom, 1728).
- LYONS, H.G., "Biographical Notes: Francis Aston (1645-1715)", *Notes and Records of the Royal Society*, 3:1 (1940), 88-92.
- , "Biographical Notes: Richard Waller (About 1650 to 1715)", *Notes and Records of the Royal Society of London* 3:1 (1940), 92-94.
- MACPIKE, E.F. (ed.), *Correspondence and Papers of Edmond Halley* (Oxford: Oxford University Press, 1975) -- Reprint of 1932 Arno Press edition.

- MAGALOTTI, L., *Saggi di naturali Esperienze, fatte nell'Accademia del Cimento* (Firenze: Cocchini, 1696).
- MALPIGHI, M., *De Formatione Pulli in Ovo* (London: Martyn for the Royal Society, 1673).
- , *Opera Posthuma* (London: Churchill, 1697).
- MENCKE, O., ed., “Observatio Dn. Leuwenhoeck de pilis. Excerpta e Transactionibus Philosophicis Anglicanis, Mensis Januarii, 1681/2, p. 93”, *Acta eruditorum*, 2 (1682), p. 511.
- , “Observationes Microscopica. Antonii Lewenhoeck, circa particulas liquorum globosas & animalia in femine insectorum masculino. Ex Collectibus Philosophicis Anglicanis num. 3. Decembr. 10. An. 1681. p. 51. sqq. Excerpte”, *Acta eruditorum*, 1 (1682), p. 321.
- MOLYNEAUX, W., *Dioptrica nova, A treatise of dioptricks in two parts* (London: Tooke, 1692).
- MUYS, W.W., *Investigatio fabricae, quae in partibus musculis componentibus extat* (Leiden: Langerak, 1741).
- NAGTEGAAL, L., ‘Een vriendschap onder druk. Willem van der Lely, Hartman de Custer en de nalatenschap van Maria en Antoni van Leeuwenhoek’, *Jaarboek Delfia Batavorum* 32 (2023), pp. 44-59.
- NORFOLK, H.H., DUKE OF, & ARUNDEL, T.H., *Bibliotheca Norfolkiana; sive, Catalogus libb. manuscriptorum et impressorum in omni arte et lingua, quos illustriss princeps, Henricus Dux Norfolcie, &c., Regie societati Londinensi pro scientia naturali promovenda donavit* (London: Chiswel, 1681).
- PALFIJN, J., *Heelkonstige Ontleeding van 's Menschen Ligbaam* (Leiden: Van der Deyster, 1718).
- PALM, L.C., “Antoni van Leeuwenhoeks reactie op Pieter Rabus’ problemen met de wichelroede”, *Tijdschrift voor de geschiedenis der geneeskunde, natuurwetenschappen, wiskunde en techniek*, 8 (1985), pp. 1-14.
- , “Leeuwenhoek and other Dutch correspondents of the Royal Society”, *Notes and Records of the Royal Society*, 43 (1989), pp. 191-207.
- , “The Edition of Leeuwenhoek’s Letters: Changing Demands, Changing Policies”, *Text*, 17 (2005), pp. 265-276.
- PALM, L.C. & SNELDERS, H.A.M. (eds.), *Antoni van Leeuwenhoek 1632-1723. Studies on the life and work of the Delft scientist commemorating the 350th anniversary of his birthday* (Amsterdam: Rodopi, 1982).
- PITCAIRNE, A., *Dissertatio de motu sanguinis per vasa minima* (Leiden: Elsevier, 1693).
- PIIT, R., *List en bedrog der medicynen: ten toon gestelt in een ontdekking der laage prijzen van de beste, en een berisping van 't gebruik der kostelijke geneesmiddelen thans meest in agtinge* (Rotterdam: Bos, 1705). Translation of *The craft and frauds of physic expos’d: the very low prices of the best medicins discover’d. The costly medicins, now in greatest esteem ... censur’d* (London: Childe, 1702).
- RABUS, P., (ed.), *Boekzaal van Europe* (Rotterdam: Van der Slaart, 1692-1702).
- , *Twee-maandelijke uittreksels* (Rotterdam: Bos, 1701-1704).
- RAMAZZINI, B., *De constitutione anni 1690, de epidemia quae Mutinensis agri et vicinarum regionum colonos graviter afflixit, dissertatio* (Modena: Cassiani, 1691).
- REES, A., *Catalogus van het Vermaarde Cabinet van Vergrootglazen ... den Heer Anthony van Leeuwenhoek* (Delft: Boitet, 1747).
- RIEU, G. DU (ed.), *Album Studiosorum Academiae Lugduno Batavae MDLXXV-MDCCCLXXV* (The Hague: Nijhoff, 1885).
- RIJNBERK, G.A. VAN, “Anthonie Leeuwenhoek, de ontdekker der konijnencoccidiën?”, *Nederlandsch Tijdschrift voor Geneeskunde* 67 (1923), 1888.
- , “Leeuwenhoek-Brieven: Een oproep”, *Nederlandsch Tijdschrift voor Geneeskunde*, 78-IV (1934), pp. 5463-5466.



- , “Lijst van gezochte brieven van Leeuwenhoek”, *Nederlandsch Tijdschrift voor Geneeskunde*, 78-IV (1934), 5467-5470.
- , “De briefwisseling tusschen Leeuwenhoek and Magliabechi”, *Nederlandsch Tijdschrift voor Geneeskunde* 81 (1937), pp. 3146-3149.
- ROBERTSON, L.A., “Van Leeuwenhoek microscopes—where are they now?”, *FEMS Microbiology Letters*, 362:9 (2015).
- RUESTOW, E.G., “Leeuwenhoek and the campaign against spontaneous generation”, *Journal of the History of Biology*, 17:2 (1984), pp. 225-248.
- ROOS, G., *De nieuwe nuttige en algemeene huis-apotheek, voor den burger en landman: gevende een beknopte beschryving van meest alle daaglyksche voorkomende ziekten en toevallen, en een aanwyzing om dezelve met geringe geneesmiddelen en kleine kosten, zonder doctor, apothecar en chirurgyn te kunnen herstellen, als ook raadgevingen van eenige voorbehoedmiddelen om ziekten vóór te komen* (Amsterdam: Roos, 1804).
- SCHELTEMA, J., *Rusland en de Nederlanden beschouwd in derzelver wederkeerige betrekkingen*, vol. 3 (Amsterdam: Gartman, 1818).
- SCHIERBEEK, A., “Anthoni van Leeuwenhoek”, *De levende natuur* (1920), 78. Reprinted in A. Schierbeek, *Van Aristoteles tot Pasteur* (Amsterdam, 1923), pp. 105-106.
- , *Antoni van Leeuwenhoek. Zijn Leven en zijn Werken* (Lochem: De Tijdstroom, 1950-1951), 2 vols. [An abridged version in English translation is: *Measuring the Invisible World. The Life and Works of Antoni van Leeuwenhoek* FRS (London/New York: Abelard-Schuman, 1959).]
- SCHUTTE, O., *Repertorium der Nederlandse vertegenwoordigers residerende in het buitenland 1584–1810* (’s Gravenhage: Nijhoff 1976).
- SETERS, W.H. VAN, “Leeuwenhoeck-Ceramiek”, *Nederlandsch Tijdschrift voor Geneeskunde* 79-II:14 (1935), pp. 1583-1587; pl. 1-4.
- SHUCKARD, W.E., *Catalogues of the Miscellaneous Manuscripts and of the Manuscript Letters in the Possession of the Royal Society* (London: Taylor, 1840).
- SNELDERS, H.A.M., “Antoni van Leeuwenhoek’s mechanistic view of the World”, in: PALM & SNEELDERS, (eds.), *Antoni van Leeuwenhoek* (1982), pp. 57-78.
- STENO, N., *Elementorum myologiae specimen* (Rome: Stellae, 1667).
- RUYSCH, F., *Observationum anatomico-chirurgicarum centuria* (Amsterdam: Boom, 1691).
- STÉVART, ARMAND, *Copernic & Galilée devant l’Université de Louvain. Process de Van Velden* (Paris / Verviers, 1890).
- STUART, A., *Dissertatio medica inauguralis de structura et motu musculari* (Leiden: Elsevier, 1711).
- SUMMERSON, J., “Christopher Wren P. R. S. (1632–1723)”, *Notes and Records of the Royal Society*, 15: 1 (1960), pp. 99-105.
- SWAMMERDAM, J., *Bybel der natuure of historie der insecten*, Part 2, (Leiden: Severinus & Van der Aa 1738).
- TARGIONI-TOZZETTI, G., *Clarorum Belgarum ad Ant. Magliabechium nonnullosque alios epistolae*, vol. 2, (Florentiae: Apollinis, 1745).
- TAYLOR, J.C., *Catalogue of the Newton Papers. Sold by Order of the Viscount Lymington, to whom they have descended from Catherine Conduitt, Viscountess Lymington, great-niece of Sir Isaac Newton* (London: Sothebys and Co, 1936).
- UFFENBACH, Z. C. VON, *Merkwürdige Reisen durch Niedersachsen Holland und Engelland*, vol. III, (Frankfurt-Leipzig: Ulm-Memmingen, 1753).
- VASSEUR, L. LE, ed., “Observations Faites avec le Microscope sur le sang et sur le lait, by A. van Leeuwenhoek”, *Recueil d’expériences et observations* (Paris: Michallet, 1679).
- VELDE, A.J.J. VAN DE, “De 2e en de 3e Engelsche reeksen der brieven van Antoni van Leeuwenhoek”, *Verslagen en mededelingen van de Koninklijke Vlaamse Academie voor Taal- en Letterkunde*, (1924), pp. 135-136.

- VELDE, A.J.J. VAN DE, "De brieven 1 tot 27 van Antoni van Leeuwenhoek", *Verslagen en mededelingen van de Koninklijke Vlaamse Academie voor Taal- en Letterkunde*, (1922), pp. 323-359.
- VERMIJ, R.H. & PALM, L.C., "John Chamberlayne als vertaler van Antoni van Leeuwenhoek", *Gewina. Tijdschrift voor de Geschiedenis der Geneeskunde, Natuurwetenschappen, Wiskunde en Techniek*, 15 (1992), pp. 234-242.
- VET, J.J.M. DE, *Pieter Rabus (1660 - 1702)* (Amsterdam: APA, 1980).
- VUGT, I. VAN, "The structure and dynamics of scholarly networks between the Dutch Republic and the Grand Duchy of Tuscany in the 17th century". PhD thesis, (Amsterdam: School of Historical Studies, 2019).
- WILLOUGHBY, F., J. RAY (eds), *De Historia Piscium* (Oxford: Sheldon Theatre, 1686).
- WITSEN, N., *Architectura navalis et regimen nauticum ofte Aloude en bedendaagsche scheeps-bouw en bestier* (Amsterdam: Blaeu, 1690).
- WOLFE, D.E., "Antoni van Leeuwenhoek. The Collected Letters. Volume VI", [book review in]: *Bulletin of the History of Medicine*, 36: 6 (1962).
- ZUIDERVAART, H.J. & ANDERSON, D., "Antony van Leeuwenhoek's microscopes and other scientific instruments: new information from the Delft archives", *Annals of Science*, 73:3 (2016), pp. 257-288.

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